



TD-20

PERCUSSION SOUND MODULE

SERVICE NOTES

Issued by RJA

TABLE OF CONTENTS

CAUTIONARY NOTES	2
SPECIFICATIONS.....	3
LOCATION OF CONTROLS	4
LOCATION OF CONTROLS PARTS LIST	5
EXPLODED VIEW	6
EXPLODED VIEW PARTS LIST	7
WIRING DIAGRAM.....	8
PARTS LIST.....	9
CHECKING THE VERSION NUMBER.....	17
INITIALIZING (FORMATTING) THE MEMORY CARD	17
USERS DATA SAVE AND LOAD.....	17
TEST MODE.....	19
RESTORING THE FACTORY SETTINGS.....	23
SYSTEM SOFTWARE UPDATE PROCEDURE	23
BLOCK DIAGRAM.....	27
CIRCUIT BOARD (MAIN)	30
CIRCUIT DIAGRAM (MAIN)	34
CIRCUIT BOARD (PANEL-U&L/MASTER/VOLUME)	52
CIRCUIT DIAGRAM (PANEL-U)	56
CIRCUIT DIAGRAM (PANEL-L)	58
CIRCUIT DIAGRAM (MASTER)	60
CIRCUIT DIAGRAM (VOLUME)	62
CIRCUIT BOARD (COAXAL/TRIG/LCD CN)	64
CIRCUIT DIAGRAM (COAXIAL)	68
CIRCUIT DIAGRAM (TRIG)	70
CIRCUIT DIAGRAM (LCD CN)	76
ERROR MESSAGES	77

Revise Information

Oct 14, 2008 (p. 2)

CAUTIONARY NOTES added

(p. 17, p. 19, p. 23) Important notes on different program versions added

(p. 24) **Process of Updating the TD-20** corrected, with partial deletions



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CAUTIONARY NOTES

When executing the Test mode with system 1.xx, never install the TDW-20.

Executing the Test mode on a TD-20 of system 1.xx while the TDW-20 is installed will delete the WAVE data stored in the TDW-20, making subsequent recovery impossible. When using the TDW-20, first upgrade the TD-20 to version 2.00 or later, and then execute the Test mode.

With system version 2.00 or later, the system cannot be started unless the TDW-20 is installed.

The system in TD-20 units of version 2.00 or later is not merely the successor of version 1.xx, but is a special system program for use in combination with the TDW-20 expansion board. For this reason, a TD-20 unit of version 2.00 or later cannot run unless the TDW-20 is installed.

- * If necessary, the unit can be returned to version 1.xx by employing the method for **Updating with CompactFlash** (p. 23).

Obtain the system program for version 1.xx from Service Net.

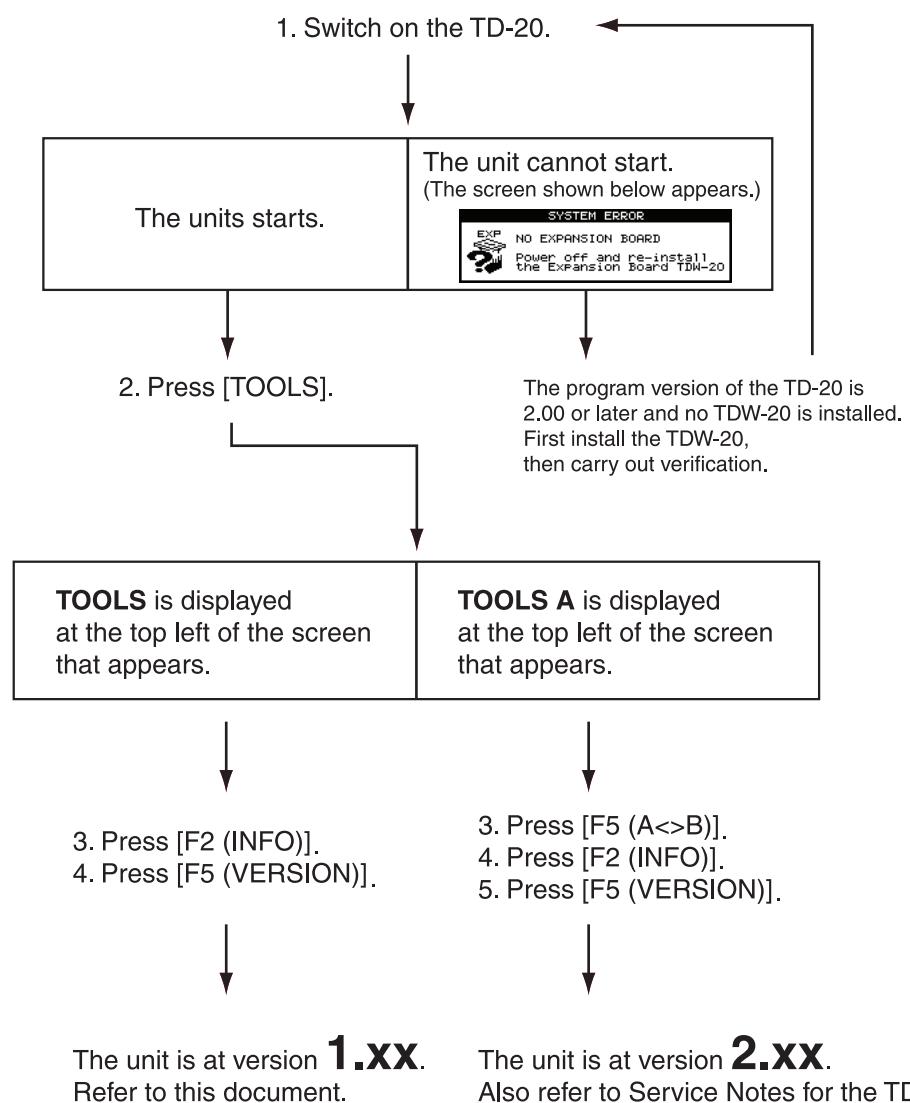
When servicing a unit of system version 2.00 or later, refer to the Service Notes for the TDW-20 as well.

With version 2.00 or later, the procedure for starting the Test mode is changed, and Test-mode items for the TDW-20 have also been added.

For more details, refer to the TDW-20 Service Notes (#17058576E0).

Verifying the Program Version

As noted above, matters such as the method used to verify the version and the procedures for the Test mode differ according to the program version. First verify the version, referring to the steps described below.



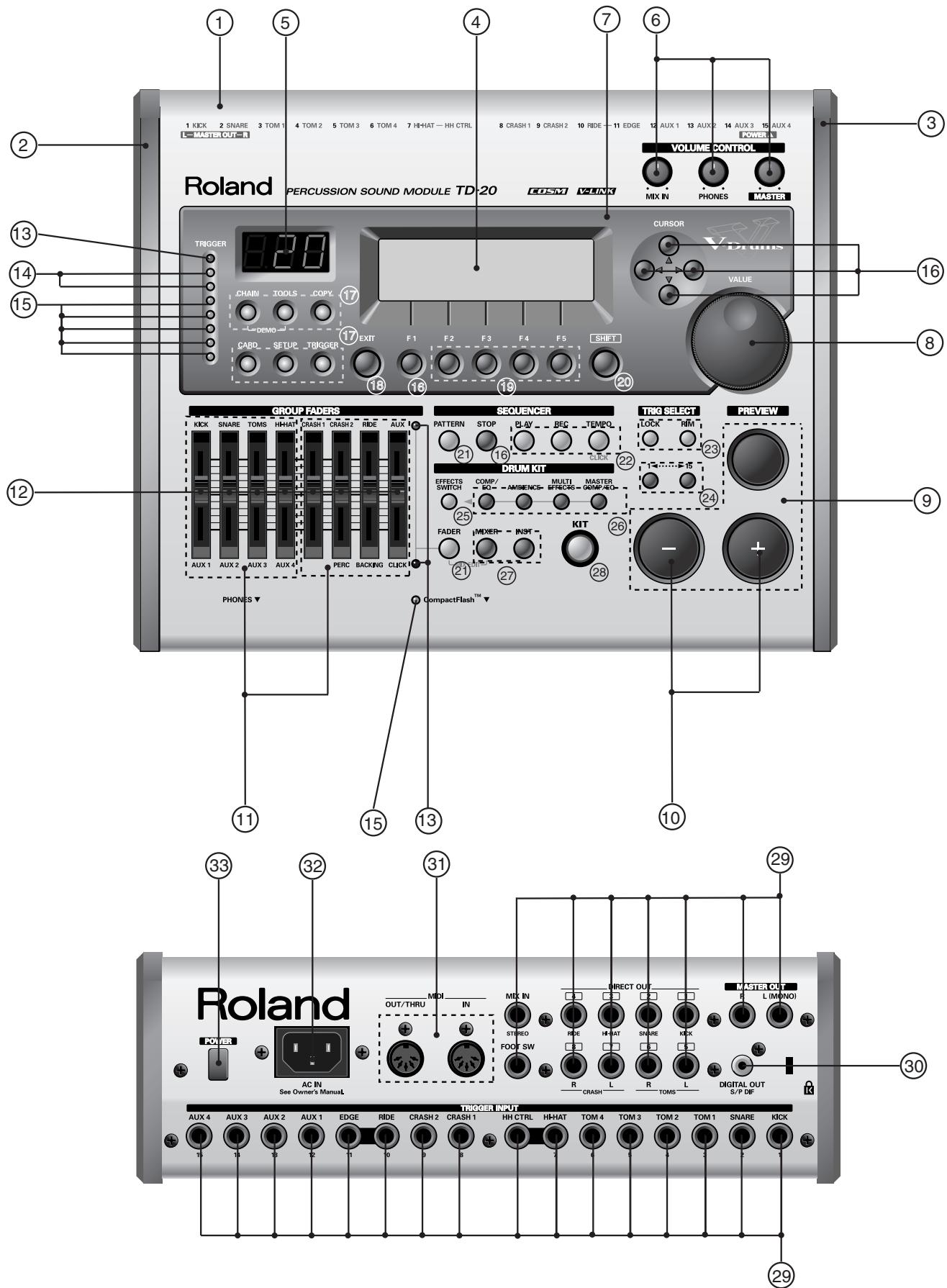
SPECIFICATIONS

TD-20: Percussion Sound Module

- Sound Generator
Variable Drum Modeling
- Maximum Polyphony
64 Voices
- Instruments
Drum Instruments: 560
Backing Instruments: 262
- Drum Kits
50
- Drum Kit Chains
16 chains (32 steps per chain)
- Instrument Parameters
V-EDIT (KICK): Shell Depth, Beater Type, Head Type, Head Tuning, Muffling, Snare Buzz, Mic Position
V-EDIT (SNARE): Shell Material, Shell Depth, Head Type, Head Tuning, Muffling, Strainer Adjustment, Mic Position
V-EDIT (TOM): Shell Depth, Head Type, Head Tuning, Muffling, Snare Buzz, Mic Position
V-EDIT (HI-HAT): Cymbal Size, Add Tambourine, Mic Position, Fixed Hi-Hat
V-EDIT (CYMBAL): Cymbal Size, Sizzle Type, Sustain, Mic Position
EDIT: Pitch, Decay
- Ambience Parameters
Room Type, Room Size, Wall Type, Mic Position, Room Shape
- Mixer Parameters
Volume, Pan, Minimum Volume, Output Assign
- Effect Types
Pad Equalizer (each pad)
Pad Compressor (each pad)
Multi-Effects: 14 types
Master Compressor
Master Equalizer
Reverb (for backing part)
Chorus (for backing part)
- Percussion Sets
8
- Sequencer
User Patterns: 100
Preset Patterns: 100
Parts: 6
Play Type: Oneshot, Loop, Tap
Tempo: 20-260
Resolution: 192 ticks per quarter note
Recording Method: Realtime
Maximum Note Storage: approx. 20,000 Notes
Click Instruments: 20
- Display
64 x 240 dots (backlit graphic LCD)
7 segments, 3 characters (LED)
Trigger Level Indicator (LED)
- Faders
8
- Preview Button
- Connectors
Trigger Input Jack x 15
Hi-Hat Control Jack (VH-12, FD-7, FD-8)
Master Output Jacks (L/MONO, R)
Direct Output Jack x 8
Digital Output Jack (COAXIAL)
Headphones Jack (Stereo 1/4 inch phone type)
Mix in Jack (Stereo 1/4 inch phone type)
MIDI Connectors (IN, OUT/THRU)
Foot Switch Jack (1/4 inch TRS phone type)
CompactFlash Card Slot
AC Inlet
- Output Impedance
1.0 k ohms
- Power Supply
AC 117 V, AC 230 V, AC 240 V (50/60 Hz)
AC 220 V (60 Hz)
- Power Consumption
16 W
- Dimensions
307 (W) x 256 (D) x 105 (H) mm
12-1/8 (W) x 10-1/8 (D) x 4-3/16 (H) inches
- Weight
2.9 kg / 6 lbs 7 oz
- Accessories
Owner's Manual English (#72459334)
Owner's Manual Japanese (#72458934)
AC Cord 120V (#00894378)
AC Cord 230V (#00894389)
AC Cord 240VE (#00907001)
AC Cord 240VA (#23495124)
- Options
Pads (PD-7, PD-8, PD-9, PD-80, PD-80R, PD-105BK, PD-125BK)
Cymbals (CY-8, CY-12H, CY-12R/C, CY-14C, CY-15R)
Kick Triggers (KD-7, KD-8, KD-80, KD-120BK)
Hi-Hat (VH-12)
Hi-Hat Control Pedal (FD-8)
Stands (MDS-20)
Cymbal Mount (MDY-10U)
Pad Mount (MDH-10U)

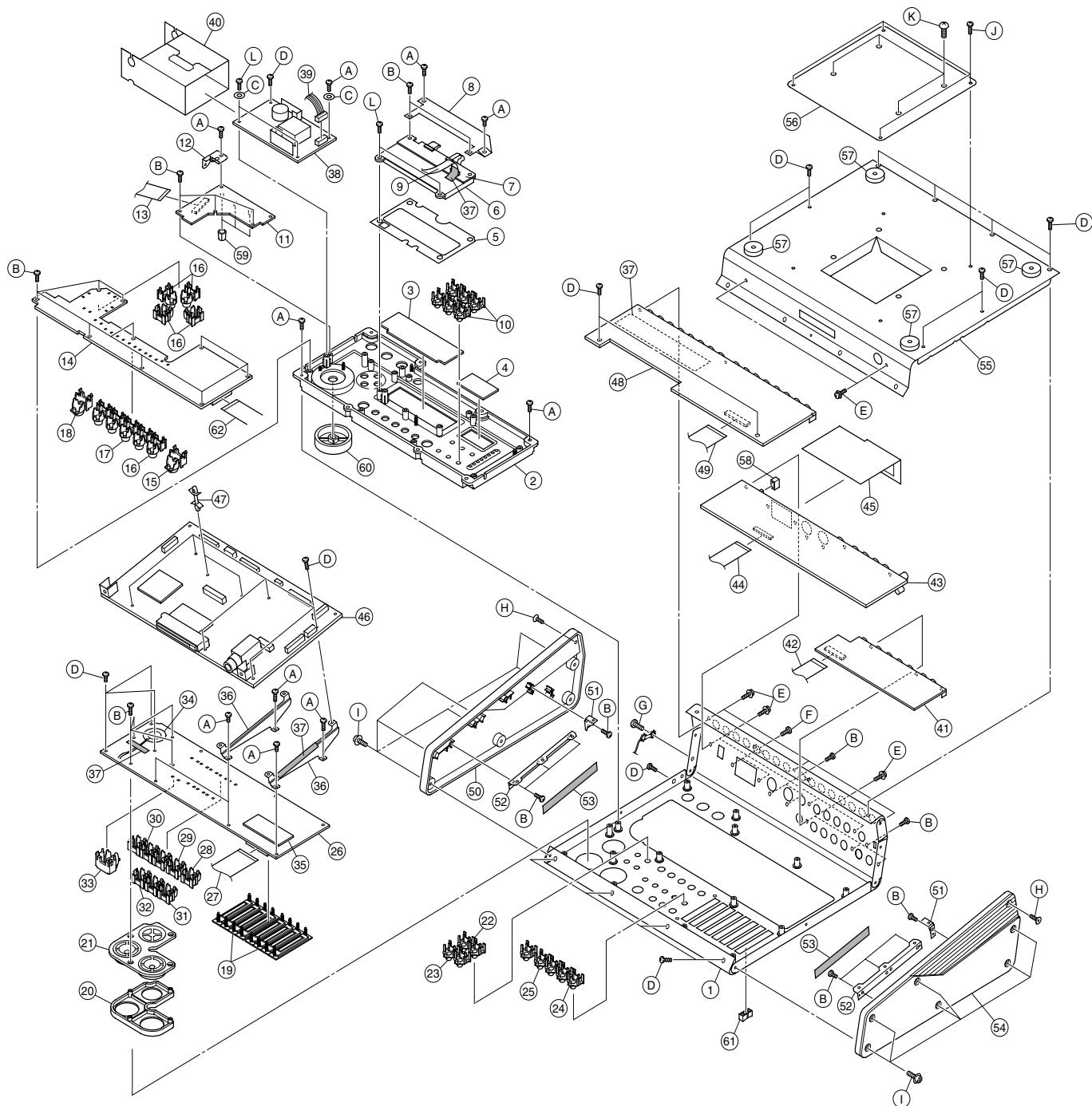
* In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.

LOCATION OF CONTROLS



LOCATION OF CONTROLS PARTS LIST

No.	PART CODE	CATEGORY	PART NAME	DESCRIPTION	Q'TY
1	03453767	CASING	TOP PANEL		1
2	03453790	CASING	SIDE PANEL L		1
3	03453801	CASING	SIDE PANEL R		1
4	03453901	CASING	DISPLAY COVER CLR		1
	03230690	DISPLAY UNIT	LCD UNIT	SCLCMEAMNI0065	1
5	03453912	CASING	DISPLAY COVER BLS		1
	01342534	DISPLAY UNIT	LED 7 SEGMENT	SL-9351S	1
6	03125589	KNOB,BUTTON	M R-KNOB	MF-ELA BLK/LCG	3
	01230034	POTENTIOMETER	12M/M ROTARY POT.	EVJ Y15 F01 B14	3
7	03453789	CASING	PANEL ESCUTCHEON		1
8	02671212	ENCODER	ROTARY ENCODER	EVE GB1 F15 24B	1
	22485303	KNOB,BUTTON	D R-KNOB(ALPHA-DIAL)	L BLK 248-303	1
9	03453823	CASING	RUBBER SW ESCUTCHEON		1
	03453812	KNOB,BUTTON	RUBBER SW		1
10	13129734	SWITCH	SWITCH(PUSH)	SKHCAD	2
11	03453845	CASING	D S-ESCU TCHEON	SX4H-A BLK L=30	2
12	22485295	KNOB,BUTTON	D S-KNOB	S BLK/LCG	8
	13339467	POTENTIOMETER	SLIDE POT.	EWA-NFEX10B14 10KB	8
13	01011656	DIODE	LED (RED)	SLR-332VR3F	1 +2
14	01011689	DIODE	LED (UNBER)	SLR-332DU	2
15	01012078	DIODE	LED (GREEN)	SLR-332MG3F	5 +1
16	02674234	KNOB,BUTTON	F C-KEYTOP	SX1H-A BLK	5 +1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	5 +1
17	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	6
	01670478	KNOB,BUTTON	F C-KEYTOP	SX3H CLR	2
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	6
18	02123467	KNOB,BUTTON	F C-KEYTOP	MX1H BLK	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	1
19	02674278	KNOB,BUTTON	F C-KEYTOP	SX4H-A BLK	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	4
20	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	1
	03560978	KNOB,BUTTON	F C-KEYTOP	MX1H GRS	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	1
21	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	2
	02674190	KNOB,BUTTON	F C-KEYTOP	SX1H-A CLR	2
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	2
22	00348490	DIODE	LED (RED)	SLR-325VCT31	1
	00560745	DIODE	LED (GREEN)	SLR-325MCT31	1
	02674212	KNOB,BUTTON	F C-KEYTOP	SX3H-A CLR	1
	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	3
23	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	2
	01670489	KNOB,BUTTON	F C-KEYTOP	SX2H CLR	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	2
24	01902734	KNOB,BUTTON	F C-KEYTOP	SX2H BLK	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	2
25	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	1
	01670490	KNOB,BUTTON	F C-KEYTOP	SX1H CLR	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	1
26	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	4
	03560967	KNOB,BUTTON	F C-KEYTOP	SX4H GRS	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	4
27	01787045	DIODE	LED (ORANGE)	SLR-325DCT31	2
	03560989	KNOB,BUTTON	F C-KEYTOP	SX2H-A GRS	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	2
28	00560745	DIODE	LED (GREEN)	SLR-325MCT31	1
	02013090	KNOB,BUTTON	F C-KEYTOP	MX1H CLR	1
	01340290	SWITCH	TACT SWITCH	EVQ11A H=5.0	1
29	00569278	JACK,EXT TERMINAL	6.5MM JACK	LGR4609-7100	1 +5 +7 +16
30	03230689	JACK,EXT TERMINAL	RCA(PIN)	YKC21-3486	1
31	13429676	JACK,EXT TERMINAL	MIDI CONNECTOR	YKF51-5048 (TWIN)	1
32	02675701	WIRING,CABLE	AC INLET ASSY	WIRING W3(AC INLET+GND)	1
33	12499175	KNOB,BUTTON	BUTTON	JSPUE001A	1
	01676512	SWITCH	PUSH SWITCH	SDKLA1-B(SDKLA10200)	1

EXPLODED VIEW

EXPLODED VIEW PARTS LIST

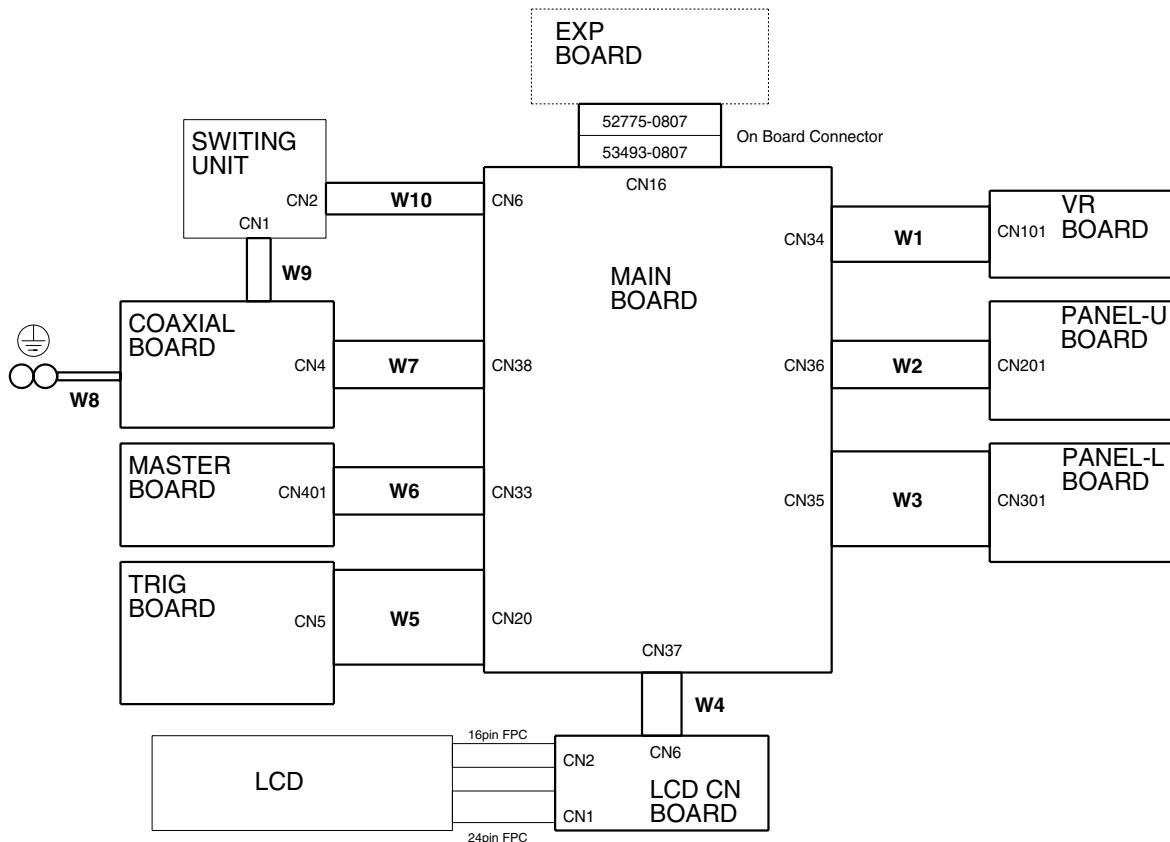
[Parts]

No.	PART CODE	CATEGORY	PART NAME	DESCRIPTION	Q'TY
1	03453767	CASING	TOP PANEL		1
2	03453789	CASING	PANEL ESCUTCHEON		1
3	03453901	CASING	DISPLAY COVER CLR		1
4	03453912	CASING	DISPLAY COVER BLS		1
5	03566423	MISCELLANEOUS	DISPLAY CUSHION		1
6	03230690	DISPLAY UNIT	LCD UNIT	SCLCMEAMNI0065	1
7	72458701	PWB ASSY	LCD CN BOARD ASSY		1
8	03560956	MISCELLANEOUS	SHIELD SHEET LCD		1
9	02789112	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-10-100	1
10	01670478	KNOB,BUTTON	F C-KEYTOP	SX3H CLR	2
11	72458756	PWB ASSY	VOLUME BOARD ASSY		1
12	03562789	CHASSIS	PWB HOLDER SW-PS GND		1
13	03453690	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-30-160	1
14	72459290	PWB ASSY	PANEL-U KEYTOP ASSY		1
15	02123467	KNOB,BUTTON	F C-KEYTOP	MX1H BLK	1
16	02674234	KNOB,BUTTON	F C-KEYTOP	SX1H-A BLK	5
17	02674278	KNOB,BUTTON	F C-KEYTOP	SX4H-A BLK	1
18	03560978	KNOB,BUTTON	F C-KEYTOP	MX1H GRS	1
19	03453845	CASING	D S-ESCUOTCHEON	SX4H-A BLK L=30	2
20	03453823	CASING	RUBBER SW ESCUTCHEON		1
21	03453812	KNOB,BUTTON	RUBBER SW		1
22	01670489	KNOB,BUTTON	F C-KEYTOP	SX2H CLR	1
23	01902734	KNOB,BUTTON	F C-KEYTOP	SX2H BLK	1
24	01670490	KNOB,BUTTON	F C-KEYTOP	SX1H CLR	1
25	03560967	KNOB,BUTTON	F C-KEYTOP	SX4H GRS	1
26	72788767	PWB ASSY	PANEL SENSOR ASSY		1
27	03453701	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-38-170	1
28	02674190	KNOB,BUTTON	F C-KEYTOP	SX1H-A CLR	1
29	02674234	KNOB,BUTTON	F C-KEYTOP	SX1H-A BLK	1
30	02674212	KNOB,BUTTON	F C-KEYTOP	SX3H-A CLR	1
31	02674190	KNOB,BUTTON	F C-KEYTOP	SX1H-A CLR	1
32	03560989	KNOB,BUTTON	F C-KEYTOP	SX2H-A GRS	1
33	02013090	KNOB,BUTTON	F C-KEYTOP	MX1H CLR	1
34	*****	PICKUP,SENSOR	SENSOR ASSY		1
35	40122556	MISCELLANEOUS	DOUBLE-FACED TAPE	NITTO #575X W30MM 30M	2
36	03453867	CHASSIS	PWB HOLDER MAIN		3
37	40122812	MISCELLANEOUS	ACETATE TAPE	NITTO #5 BLK W15MM 30M	3
38	01785823	POWER SUPPLY UNIT	SWITCHING REGULATOR	A1DU2L3B034	1
39	03453512	WIRING,CABLE	WIRING W1		1
40	02894367	MISCELLANEOUS	INSULATING COVER	SW-PS	1
41	72458712	PWB ASSY	MASTER BOARD ASSY		1
42	03453656	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-26-90	1
43	72458678	PWB ASSY	COAXIAL BOARD ASSY		1
44	03453667	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-28-50	1
45	03453890	MISCELLANEOUS	INSULATING SHEET		1
46	72458656	PWB ASSY	MAIN BOARD TOTAL		1
47	00670734	MISCELLANEOUS	PWB SPACER	WLS-12-0	2
48	72458745	PWB ASSY	TRIG BOARD ASSY		1
49	03453723	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-40-60	1
50	03453801	CASING	SIDE PANEL R		1
51	03453878	CHASSIS	PWB HOLDER SIDE		2
52	03453889	CASING	SIDE ANGLE		2
53	40122812	MISCELLANEOUS	ACETATE TAPE	NITTO #5 BLK W15MM 30M	2
54	03453790	CASING	SIDE PANEL L		1
55	03453778	CASING	BOTTOM COVER		1
56	01231189	CASING	EXP COVER		1
57	01235378	MISCELLANEOUS	FOOT		4
58	12499175	KNOB,BUTTON	BUTTON	JSPUE001A	1
59	03125589	KNOB,BUTTON	M R-KNOB	MF-ELA BLK/LCG	3
60	22485303	KNOB,BUTTON	D R-KNOB(ALPHA-DIAL)	L BLK 248-303	1
61	22485295	KNOB,BUTTON	D S-KNOB	S BLK/LCG	8
62	03453689	WIRING,CABLE	BAN CARD	BNCD-P=1.00-K-28-90	1

[Screws]

No.	PART CODE	PART NAME	DESCRIPTION	Q'TY
A	40011067	SCREW 3x8	BINDING TAPITTE B FE ZC	12
B	40011312	SCREW 3x8	BINDING TAPITTE P BZC	29
C	40011956	PLAIN WASHER 3x10x0.8	ZC	3
D	40011090	SCREW 3x6	BINDING TAPITTE B BZC	25
E	40237101	SCREW M3x8	PAN MACHINE W/SW+PW FE BZC	11
F	40011123	SCREW 4x8	BINDING TAPITTE B BZC	2
G	40011378	SCREW M4x8	BINDING TAPITTE S FE BZC	1
H	40011156	SCREW 3x8	FLAT TAPITTE B BZC	2
I	40454045	SCREW 3x8	FLAT TAPITTE NI FLANGE SOCKET	12
J	40019123	SCREW 3x8	BINDING TAPITTE S BZC	4
K	40238145	SCREW M5x12	TRUSS BZC	4
L	40011289	SCREW 3x10	BINDING TAPITTE P ZC	4

WIRING DIAGRAM



[Parts]

No	PART CODE	PART NAME
W1	03453690	BAN CARD BNCD-P=1.00-K-30-160
W2	03453689	BAN CARD BNCD-P=1.00-K-28-90
W3	03453701	BAN CARD BNCD-P=1.00-K-38-170
W4	02789112	BAN CARD BNCD-P=1.00-K-10-100
W5	03453723	BAN CARD BNCD-P=1.00-K-40-60
W6	03453656	BAN CARD BNCD-P=1.00-K-26-90
W7	03453667	BAN CARD BNCD-P=1.00-K-28-50
W8	02675701	WIRING W3(AC INLET+GND)
W9	02678478	WIRING W1
W10	03453512	WIRING W1

PARTS LIST

SAFETY PRECAUTIONS: The parts marked have safety-related characteristics. Use only listed parts for replacement.	CONSIDERATION ON PARTS ORDERING When ordering any parts listed in the parts list, please specify the following items in the order sheet. QTY PART NUMBER DESCRIPTION MODEL NUMBER EX. 10 22975241 Sharp Key C-20/50 15 2247017300 Knob (orange) DAC-15D Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.			
NOTE: The parts marked # are new. (initial parts)				

Apparatus containing Lithium batteries				
CAUTION Danger of explosion if battery is incorrectly replaced.	VAROITUS Paristo voi räjähtää, jos se on virheellisesti asennettu.	ADVARESEL! Lithiumbatteri. Eksplosjonsfare ved feilaktig håndtering.	ADVARSEL Eksplosjonsfare ved feilaktig skifte av batteri.	WARNING Explosionstara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattfabrikanten.

			For EU Countries	Q'TY
#	03453778	BOTTOM COVER		1
#	03453912	DISPLAY COVER BLS		1
#	03453901	DISPLAY COVER CLR		1
#	03453845	D S-ESCRUTCHEON	SX4H-A BLK L=30	2
	01231189	EXP COVER		1
#	03453789	PANEL ESCRUTCHEON		1
#	03453823	RUBBER SW ESCRUTCHEON		1
#	03453889	SIDE ANGLE		2
#	03453790	SIDE PANEL L		1
#	03453801	SIDE PANEL R		1
#	03453767	TOP PANEL		1

			For EU Countries	Q'TY
#	03453867	PWB HOLDER MAIN		3
#	03453878	PWB HOLDER SIDE		2
#	03562789	PWB HOLDER SW-PS GND		1

			For EU Countries	Q'TY
	12499175	JSJUE001A	BUTTON	1
	22485303	L BLK 248-303	D R-KNOB(ALPHA-DIAL)	1
	22485295	S BLK/LCG	D S-KNOB	8
	01670490	SX1H CLR	F C-KEYTOP	1
	01902734	SX2H BLK	F C-KEYTOP	1
	01670489	SX2H CLR	F C-KEYTOP	1
	01670478	SX3H CLR	F C-KEYTOP	2
#	03560967	SX4H GRS	F C-KEYTOP	1
	03125589	MF-ELA BLK/LCG	M R-KNOB	3
#	03453812	RUBBER SW		1

			For EU Countries	Q'TY
	01676512	SDKLA1-B(SDKA10200)	PUSH SWITCH	1
	13129734	SKHCAD	PUSH SWITCH	2
	01340290	EVQ11A H=5.0	TACT SWITCH	17
				+18
				SW304 on PANEL-L.
				SW211,SW205,SW216,SW215,SW214,SW213,SW217,SW212,SW207,SW204,SW203,SW202,SW201,SW206,SW210,SW208,SW209 on PANEL-U

			For EU Countries	Q'TY
	00569278	LGR4609-7100	6.5MM JACK	1
				JK1 on MAIN, JK401,JK402,JK403,JK404, on MASTER, JK29,JK25,JK27,JK26,JK28 on COAXIAL.
				JK1,JK2,JK3,JK4,JK5,JK6,JK7,JK8,JK9,JK10,JK11,JK12,JK13,JK14,JK15,JK16 on TRIG
	03230689	YKC21-3486	RCA(PIN)	1
	13429676	YKF51-5048 (TWIN)	MIDI CONNECTOR	1
	03121678	ICM-MA2H-SS52-R21A	CARD CONECTR	1
	03121689	ICM-MAE-R21	COMPACTFLASH EJECTOR	1

			For EU Countries	Q'TY
	#	03230690	SCLCMEAMNI0065	1
LCD UNIT				
				NOTE: Replacement LCD UNIT SCLCMEAMNI0065 should be made on a unit base.
LED 7 SEGMENT				
		01342534	SL-9351S	1
LED 7 SEGMENT				
				NOTE: Replacement LED 7 SEGMENT SL-9351S should be made on a unit base.

POWER SUPPLY UNIT

△	01785823	A1DU2L3B034	SWITCHING REGULATOR	1
NOTE: Replacement SWITCHING REGULATOR A1DU2L3B034 should be made on a unit base.				

PCB ASSY

△ #	72458656	MAIN BOARD TOTAL		1
NOTE: 'MAIN BOARD TOAL' includes the following parts.				
#	03453856	CF ESCUTCHEON BLK		1
	40011312	SCREW 3x8	BINDING TAPITTE P BZC	2
	00670734	PWB SPACER	WLS-12-0	2
#	72458678	COAXIAL BOARD ASSY		1
NOTE: 'COAXIAL BOARD ASSY' includes the following parts.				
△	02675701	AC INLET ASSY	WIRING W3(AC INLET+GND)	1
	02678478	WIRING	WIRING W1	CN3 on COAXIAL
#	72459290	PANEL-U KEYTOP ASSY		1
NOTE: 'PANEL-U KEYTOP ASSY' includes the following parts.				
	12169406	LED SPACER		8
	02123467	F C-KEYTOP	MX1H BLK	1
#	03560978	F C-KEYTOP	MX1H GRS	1
	02674234	F C-KEYTOP	SX1H-A BLK	5
#	02674278	F C-KEYTOP	SX4H-A BLK	+1
#	72788767	PANEL SENSOR ASSY		1
NOTE: 'PANEL SENSOR ASSY' includes the following parts.				
	12169406	LED SPACER		3
	02013090	F C-KEYTOP	MX1H CLR	1
	02674234	F C-KEYTOP	SX1H-A BLK	5
	02674190	F C-KEYTOP	SX1H-A CLR	+1
#	03560989	F C-KEYTOP	SX2H-A GRS	2
#	02674212	F C-KEYTOP	SX3H-A CLR	1
△ #	*****	SENSOR ASSY		1
NOTE: 'SENSOR ASSY' includes the following parts.				
NOTE: Replacement SENSOR ASSY should be made on a PANEL SENSOR ASSY base.				
NOTE: Please don't take SENSOR ASSY apart. It short-circuit is dangerous.				
	*****	DOUBLE-FACED TAPE	#536 18 PHI	1
#	*****	WIRING W2		1
#	72458701	LCD CN BOARD ASSY		1
#	72458712	MASTER BOARD ASSY		1
#	72458745	TRIG BOARD ASSY		1
#	72458756	VOLUME BOARD ASSY		1

IC

#	03564790	UPD703106AGJ-081-UEN(TD20M 1.0)	IC (CPU)	IC2 on MAIN	1
#	03456523	UPD703106AGJ-082-UEN(TD20T 1.0)	IC (CPU)	IC10 on MAIN	1
#	03347112	LC4032V-75TN48C VER1.00	IC (CUSTOM)	IC207 on MAIN	1
*****	TC58FVM5B2ATG65BAH	IC (FLASH MEMORY/BLANK)	IC1 on MAIN	1	
01455956	TC223C660CF-503	IC (RA08-503)	IC52 on MAIN	1	
02231767	RA0A-101 (TC223C080AF-101)	IC (DSP)	IC55 on MAIN	1	
02908656	DAC AK4382-AVT-E2	IC (DAC)	IC21,IC19 on MAIN	2	
#	03230367	AK4628VQ	IC (AD/DA)	IC25 on MAIN	1
#	03453490	MR27V12800J-OT4T4N (TD20-1)	IC (MASK ROM)	IC205 on MAIN	1
#	03453501	MR27V12800J-OT5T5N (TD20-2)	IC (MASK ROM)	IC206 on MAIN	1
03017856	M11L16161SA-45T	IC (DRAM)	IC73 on MAIN	1	
02784856	M11L416256SA-35T	IC (DRAM)	IC57 on MAIN	1	
03237689	M12L64164A-7T	IC (SDRAM)	IC4 on MAIN	1	
03348812	M12L16161A-7T	IC (SDRAM)	IC11 on MAIN	1	
#	03233323	CY62146VLL-70ZI	IC (SRAM)	IC3 on MAIN	1
15269219H0	HD74LS05FPEL	IC (TTL)	IC30 on COAXIAL	1	
02675645	HD74LV04ATELL	IC (CMOS)	IC301 on PANEL-L. IC201 on PANEL-U	1	
02451690	HD74LV08ATELL	IC (CMOS)	IC200,IC69,IC50,IC7 on MAIN	+1	
02451712	HD74LV14ATELL	IC (CMOS)	IC208 on MAIN. IC14,IC15,IC16 on TRIG	4	
02675689	HD74LV245ATELL	IC (CMOS)	IC48,IC71,IC70,IC68,IC65,IC74,IC58,IC46,I C45,IC43,IC42,IC63 on MAIN	+3	
02901590	HD74LVU04ATELL	IC (CMOS)	IC25 on COAXIAL	12	
01672634	TC74HC4052AFT(EL)	IC (COMS)	IC36 on MAIN. IC18,IC19,IC20 on TRIG	1	
01458401	TC74LVX4245FS(EL)	IC (TTL)	IC64,IC66,IC72,IC75 on MAIN	+3	
01901623	TC74LVXC3245FS	IC (CMOS)	IC49,IC53 on MAIN	4	
03016167	TC74VHCT08AFT(EL)	IC (CMOS)	IC40,IC61,IC51,IC41,IC8 on MAIN	2	
01783523	TC74VHCT245AFT(EL)	IC (CMOS)	IC54,IC59 on MAIN	5	
#	02456734	TC74VHCT74AFT(EL)	IC (CMOS)	IC56 on MAIN	2
01348901	TC7SH04FU(TE85L)	IC (CMOS)	IC22 on MAIN	1	

IC				
01450178	TC7W14FU(TE12L)	IC (CMOS)	IC29 on COAXIAL	1
02232356	TC7WH125FU(TE12L)	IC (CMOS)	IC47 on MAIN	1
01349590	TC7WU04FU(TE12L)	IC (CMOS)	IC5 on MAIN	1
15199937	M51953BFP-600C	IC (RESET)	IC9 on MAIN	1
15289106	M5238AAPP-600C	IC (JFET OP AMP)	IC6 on MAIN	1
15189261	M5218AAPP-600E	IC (BIPOLAR OP AMP)	IC28,IC17,IC16,IC15,IC14,IC30,IC23,IC26,I C32 on MAIN. IC401,IC402,IC403,IC404 on MASTER. IC27,IC26 on COAXIAL.	+2 +4
			IC102,IC103,IC101 on VOLUME. IC13 on TRIG	+1 +3
03129190	UPC324G2-E2	IC (BIPOLAR OP)	IC35 on MAIN. IC1,IC2,IC3,IC4,IC5,IC6,IC7,IC8,IC9,IC10,I C11,IC12,IC23,IC24 on TRIG	1 +1 4
#	03123734	PQ033DZ01ZP	IC (REGULATOR)	IC201,IC202 on MAIN
	15289402	TA78L05F(TE12L)	IC (REGULATOR)	IC29 on MAIN
	03347023	TA79L05F(TE12L)	IC (REGULATOR)	IC31 on MAIN
	01785178	TC9271FS	IC (DIGITAL OUT IF)	IC13 on MAIN
	02900545	PC410LKNIP	IC (PHOTO COUPLER)	IC28 on COAXIAL
TRANSISTOR				
15309103	2SA1202-Y(TE12L C)	TRANSISTOR	Q10,Q7 on MAIN	2
01121278	2SA1576A T106 QRS	TRANSISTOR	Q3,Q11 on MAIN	2
15319102	2SC2882-Y(TE12L.C)	TRANSISTOR	Q5,Q8 on MAIN	2
01121289	2SC4081 T106 QRS	TRANSISTOR	Q18,Q16,Q20,Q22,Q21,Q19,Q17,Q23,Q12 on MAIN	9
15319115	2SC4213-A(TE85L)	TRANSISTOR	Q6,Q9 on MAIN. Q401,Q402,Q403,Q404,Q405, on MASTER.	2 +4
			Q8,Q9,Q7,Q10 on COAXIAL	+6
00239801	DTA114EU T-106	TRANSISTOR	Q24,Q1 on MAIN. Q11 on COAXIAL	2 +1
00239812	DTC114EUT106	TRANSISTOR	Q13,Q25,Q4,Q2 on MAIN	4
01783612	RN2426(TE85L)	TRANSISTOR	Q302,Q304,Q303,Q301 on PANEL-L. Q201,Q202,Q203,Q204,Q205 on PANEL-U	5 +4
DIODE				
01127489	RB715F T106	SCHOTTKY DIODE	DA1,DA26 on MAIN	2
02675734	UDZS TE-17 12B	ZENER DIODE	D3,D1 on MAIN	2
01011656	SLR-332VR3F	LED (RED)	LED317,LED311 on PANEL-L. LED214 on PANEL-U	1 +2
01012078	SLR-332MG3F	LED (GREEN)	LED312 on PANEL-L. LED215,LED207,LED209,LED216,LED208 on PANEL-U	5 +1
01011689	SLR-332DU	LED (UNBER)	LED206,LED213 on PANEL-U	2
00348490	SLR-325VCT31	LED (RED)	LED302 on PANEL-L	1
00560745	SLR-325MCT31	LED (GREEN)	LED318,LED306 on PANEL-L	2
01787045	SLR-325DCT31	LED (ORANGE)	LED308,LED316,LED301,LED303,LED304,L ED307,LED309,LED310,LED313,LED314,LE D315,LED305 on PANEL-L. LED202,LED212,LED204,LED205,LED211,L ED203,LED210 on PANEL-U	7 +1 2
01897189	MA147-(TX)	DIODE ARRAY	DA22,DA23,DA202 on MAIN	3 +7 1
15339130	MA142WK-(TX)	DIODE ARRAY	DA30,DA20,DA16,DA200,DA31,DA24,DA 201,DA203,DA10,DA8,DA12,DA2,DA6 on MAIN. DA401 on MASTER. DA311,DA308,DA310,DA309,DA301,DA30 2,DA303,DA304,DA305,DA306,DA307 on PANEL-L. DA205,DA201,DA202,DA204,DA206,DA20 7,DA208,DA209,DA203 on PANEL-U. DA3 on COAXIAL	13 +1 +1 +7 +9 +1 +1 1
01897178	MA142WA-(TX)	DIODE ARRAY	DA21,DA13,DA9,DA7,DA17 on MAIN. DA402 on MASTER. DA4,DA5 on COAXI AL	5 +2 +1 +7
RESISTOR				
15399945	MCR100 101J	RESISTOR	R140,R96,R94,R79,R77,R145 on MAIN	6
15399750	MCR100 39 1W	RESISTOR	R6,R5 on LCD CN	2
15399705	MCR25JZH331	MTL.FILM RESISTOR	R407,R416,R425,R434,R443, on MASTER.	4
01569734	MCR25 JZH J 681	MTL.FILM RESISTOR	R66,R75,R84,R93 on COAXIAL	+6
01011856	RPC05T 0R0 J	MTL.FILM RESISTOR	R409,R418,R427,R436,R445, on MASTER. R67,R94,R85,R76 on COAXIAL	4 +6
			R143,R21,R56,R100,R123,R127,R132,R603,R 9,R138,R148,R152,R156,R272,R403,R602,R4 05 on MAIN. L402,L404,R405,L406,L408 on MASTER. L73,L69,R74,R92,L75,R83,R65,L71 on COAXIAL	17 +8 +13
00566867	RPC05T 100 J	MTL.FILM RESISTOR	R120,R119 on MAIN	2

RESISTOR					
00567023	RPC05T 101 J	MTL.FILM RESISTOR	R424,R622,R410,R411,R412,R413,R414,R415 ,R416,R408,R423,R407,R434,R435,R604,R60 5,R610,R611,R612,R613,R162,R417,R202,R1 64,R167,R168,R170,R175,R182,R187,R409,R 200,R623, R206,R232,R233,R234,R235,R236,R237,R238 ,R239,R406,R194,R58,R620,R53,R111,R116,R 117,R158,R161,R636,R637,R18,R702 on MAIN. R305 on PANEL-L. R11 on COAXIAL. R102,R101,R103,R104,R105,R106 on VOLUME. R172,R174,R176,R178,R180,R182,R184,R186 on TRIG	56 +1 +8 +6 +1	
00567156	RPC05T 102 J	MTL.FILM RESISTOR	R640,R701,R29,R634,R259,R258,R95,R78 on MAIN. R459,R460 on MASTER. R9 on COAXIAL. R106,R107,R118,R119,R206,R207,R218,R219 ,R306,R307,R318,R319,R406,R407,R418,R41 9,R506,R507,R518,R519,R606,R607,R718,R7 19,R806,R807,R818,R819,R906,R907,R918,R 919,R1006,R1007,R1018,R1019,R1106,R1107 ,R1118,R1119,R1206,R1207,R1218,R1219 on TRIG	8 +1 +2 +44	
00567289	RPC05T 103 J	MTL.FILM RESISTOR	R219,R109,R115,R214,R216,R257,R218,R269 ,R256,R10,R106,R267,R217,R99,R83,R55,R50 ,R46,R45,R38,R35,R33,R32,R28,R20,R607,R8 ,R22,R608,R609,R633,R639,R700,R438,R601 on MAIN. R408,R417,R426,R435,R444, on MASTER. R90,R81,R72,R99,R159 on COAXIAL. R16,R103,R105,R115,R117,R163,R165,R169 ,R203,R205,R215,R217,R303,R305,R315,R317 ,R403,R405,R415,R417,R503,R505,R515,R51 7,R603,R605,R715,R717,R803,R805,R815,R8 17,R903,R905,R915,R917,R1003,R1005,R101 5,R1017,R1103,R1105,R1115,R1117,R1203,R 1205,R1215,R1217 on TRIG	35 +5 +6 +48	
00567412	RPC05T 104 J	MTL.FILM RESISTOR	R112,R254,R253,R252,R208,R205,R204,R169 ,R251,R250,R118,R2,R98,R97,R249,R82,R255 ,R81,R44,R248,R36,R31,R30,R4,R163,R422,R 606,R619,R621,R209,R421 on MAIN. R401,R406,R410,R415,R419, on MASTER. R88,R98,R97,R89,R80,R71,R70,R79 on COAXIAL. R4,R3,R2,R1 on LCD CN . R100,R101,R112,R113,R160,R161,R166,R167 ,R173,R175,R177,R179,R181,R183,R185,R18 7,R200,R201,R212,R213,R300,R301,R312,R3 13,R400,R401,R412,R413,R500,R501,R512,R 513,R600,R601,R712,R713,R800,R801,R812 ,R813,R900,R901,R912,R913,R1000,R1001,R1 012,R1013,R1100,R1101,R1112,R1113,R1200 ,R1212,R1213 on TRIG	31 +8 +4 +12 +56	
00567556	RPC05T 105 J	MTL.FILM RESISTOR	R23 on MAIN	1	
00567689	RPC05T 106 J	MTL.FILM RESISTOR	R34 on MAIN	1	
00567034	RPC05T 121 J	MTL.FILM RESISTOR	R10 on COAXIAL	1	
00567290	RPC05T 123 J	MTL.FILM RESISTOR	R402,R403,R411,R412,R420 on MASTER. R86,R68,R69,R77,R78,R95,R96,R87 on COAXIAL	8 +12	
00567423	RPC05T 124 J	MTL.FILM RESISTOR	R465 on MASTER	1	
00567301	RPC05T 153 J	MTL.FILM RESISTOR	R60,R88,R84,R80,R68,R67,R64,R63 on MAIN	8	
00566912	RPC05T 220 J	MTL.FILM RESISTOR	R273,R40,R437,R110,R271,R436,R230 on MAIN	7	
00567067	RPC05T 221 J	MTL.FILM RESISTOR	R211,R210 on MAIN. R304 on PANEL-L. R13,R14 on COAXIAL	2 +2 +1	
00567323	RPC05T 223 J	MTL.FILM RESISTOR	R215 on MAIN. R108,R109,R110,R111,R120,R121,R122,R123 ,R208,R209,R210,R211,R220,R221,R222,R22 3,R308,R309,R310,R311,R320,R321,R322,R3 23,R408,R409,R410,R411,R420,R421,R422,R 423,R508,R509,R510,R511,R520,R521,R522 ,R523,R608,R609,R610,R611,R720,R721,R722 ,R723,R808,R809,R810,R811,R820,R821,R82 2,R823,R908,R909,R910,R911,R920,R921,R9 22,R923,R1008,R1009,R1010,R1011,R1020,R 1021,R1022,R1023,R1108,R1109,R1110,R111 1,R1120,R1121,R1122,R1123,R1208,R1209,R 1210,R1211,R1220,R1221,R1222,R1223 on TRIG	1 +88	
00567456	RPC05T 224 J	MTL.FILM RESISTOR	R197 on MAIN. R455,R456,R461,R462 on MASTER	1 +4	
00567201	RPC05T 272 J	MTL.FILM RESISTOR	R5,R274 on MAIN	2	
00567212	RPC05T 332 J	MTL.FILM RESISTOR	R114,R108 on MAIN	2	
00567345	RPC05T 333 J	MTL.FILM RESISTOR	R151,R142,R155,R122,R126,R130,R137,R69 ,R87,R147 on MAIN	10	
00567234	RPC05T 392 J	MTL.FILM RESISTOR	R74,R86,R85,R61,R62,R65,R66,R71 on MAIN	8	

RESISTOR				
00567367	RPC05T 393 J	MTL.FILM RESISTOR	R463,R464 on MASTER	2
00566967	RPC05T 470 J	MTL.FILM RESISTOR	R222,R43,R42,R638,R13,R12,R221,R225,R22 9,R231,R400,R401,R617,R51,R635,R618 on MAIN. R303,R302,R301 on PANEL-L.	16 +5 +3
00567112	RPC05T 471 J	MTL.FILM RESISTOR	R26 on MAIN	1
00567245	RPC05T 472 J	MTL.FILM RESISTOR	R220,R16,R37,R41,R54,R93,R92,R632,R76,R 75 on MAIN. R108,R109,R110,R107 on VOLUME	10 +4
00567378	RPC05T 473 J	MTL.FILM RESISTOR	R103,R102 on MAIN. R7,R8 on COAXIAL	2 +2
00567501	RPC05T 474 J	MTL.FILM RESISTOR	R107,R198 on MAIN. R12 on COAXIAL	2 +1
00567256	RPC05T 562 J	MTL.FILM RESISTOR	R149,R128,R129,R135,R136,R139,R141,R146 ,R150,R153,R154,R157,R125,R121,R124,R14 4 on MAIN. R15,R164 on TRIG	16 +2
00567512	RPC05T 564 J	MTL.FILM RESISTOR	R466 on MASTER	1
00566990	RPC05T 680 J	MTL.FILM RESISTOR	R614,R39,R6,R11,R14,R15,R17,R616,R27,R6 15,R52,R207,R223,R226,R228,R429,R433,R3 41,R24,R227 on MAIN	20
00567267	RPC05T 682 J	MTL.FILM RESISTOR	R243,R242,R246,R240,R247,R241,R245,R244 on MAIN	8
00567390	RPC05T 683 J	MTL.FILM RESISTOR	R458,R457 on MASTER. R102,R104,R114,R116,R162,R168,R202,R204 ,R214,R216,R302,R304,R316,R402,R404,R41 4,R416,R502,R504,R514,R516,R602,R604,R7 14,R716,R802,R804,R814,R816,R902,R904,R 914,R916,R1002,R1004,R1014,R1016,R1102, R1104,R1114,R1116,R1202,R1204,R1214,R12 16 on TRIG	2 +46
00567523	RPC05T 684 J	MTL.FILM RESISTOR	R199 on MAIN	1
00567001	RPC05T 750 J	MTL.FILM RESISTOR	R63 on COAXIAL	1
00567278	RPC05T 822 J	MTL.FILM RESISTOR	R89,R73,R72,R70,R90,R91 on MAIN	6
02781623	EXB2HV101JV	RESISTOR ARRAY	RA70,RA80,RA81,RA84,RA85,RA201,RA20 2,RA7,RA55,RA66,RA63 on MAIN	11
02678534	EXB2HV103V	RESISTOR ARRAY	RA68,RA67 on MAIN	2
02456878	EXB2HV220JV	RESISTOR ARRAY	RA72,RA16,RA39,RA44,RA47,RA49,RA50, RA17,RA76,RA104,RA107,RA108,RA109,R A110,RA111,RA113,RA10,RA40,RA112,RA 5,RA3,RA8,RA46 on MAIN	23
03015056	EXB2HV470JV	RESISTOR ARRAY	RA75,RA52,RA77,RA71,RA61,RA56,RA203 ,RA30,RA29,RA27,RA25,RA24,RA14,RA78, RA31 on MAIN	15
01457145	EXBE10C103J	RESISTOR ARRAY	RA2,RA82,RA53,RA20,RA23,RA28,RA34,R A43,RA83,RA51,RA21,RA54,RA57,RA58,R A60,RA69,RA6,RA74,RA48,RA73 on MAIN	20
00126112	EXBV8V101JV	RESISTOR ARRAY	RA37,RA207,RA206,RA64,RA19,RA205 on MAIN. RA14 on COAXIAL.	6 +1
00344278	EXBV8V102JV	RESISTOR ARRAY	RA4,RA7,RA10,RA13 on TRIG	+4
00344278	EXBV8V102JV	RESISTOR ARRAY	RA15 on COAXIAL. RA1 on TRIG	1 +1
15409113	EXBV8V103JV	RESISTOR ARRAY	RA18,RA41,RA204,RA9,RA15,RA22,RA45, RA62,RA65,RA100,RA42 on MAIN	11
00902856	EXBV8V104JV	RESISTOR ARRAY	RA2,RA5,RA8,RA11 on TRIG	4
00909801	EXBV8V220JV	RESISTOR ARRAY	RA13 on MAIN	1
01126201	EXBV8V332JV	RESISTOR ARRAY	RA79 on MAIN. RA3,RA6,RA9,RA12 on TRIG	1 +4
01013578	EXBV8V470JV	RESISTOR ARRAY	RA200,RA33,RA11,RA32,RA208,RA26,RA1 2,RA4 on MAIN	8
01011845	EXBV8V0R000V	RESISTOR ARRAY	RA102 on MAIN	1
POTENTIOMETER				
01230034	EVJ Y15 F01 B14	12M/M ROTARY POT.	VR101,VR103,VR102 on VOLUME	3
13339467	EWA-NFEX10B14 10KB	SLIDE POT.	VR305,VR304,VR303,VR302,VR301,VR307, VR306,VR308 on PANEL-L	8
CAPACITOR				
02129534	ECJ1VB1H102K	CERAMIC CAPACITOR	C426,C324,C261,C518,C72,C422,C52,C5,C1 8,C615,C614,C601,C519,C425 on MAIN. C407,C412,C417,C422,C427, on MASTER. C14,C94,C83,C78,C69,C17,C16,C15 on COAXIAL	14 +8 +6
01674612	ECJ1VB1H103K	CERAMIC CAPACITOR	C98,C99,C58 on COAXIAL. C25,C140,C141,C142,C143,C144,C145,C146, C147,C151,C161,C162,C163,C164,C165,C16 6,C167 on TRIG	3 +17
01674512	ECJ1VB1H222K	CERAMIC CAPACITOR	C303 on MAIN	1
01674167	ECUV1H100DCV	CERAMIC CAPACITOR	C61,C60,C59 on COAXIAL. C117,C157 on TRIG	3 +2
01674190	ECUV1H150JCV	CERAMIC CAPACITOR	C363,C602,C603,C604,C605,C112,C100 on MAIN	7

CAPACITOR				
01674212	ECUV1H220JCV	CERAMIC CAPACITOR	C158,C138,C187,C176,C165,C269,C147,C194,C143,C268,C212 on MAIN. C435,C433 on MASTER.	¹¹ ₊₆₆
01674234	ECUV1H330JCV	CERAMIC CAPACITOR	C103,C104,C105,C109,C110,C111,C203,C204,C205,C209,C210,C211,C303,C304,C305,C309,C310,C311,C403,C404,C405,C409,C410,C411,C503,C504,C505,C509,C510,C511,C603,C604,C605,C709,C710,C711,C803,C804,C805,C809,C810,C811,C903,C904,C905,C909,C910,C911,C1003,C1004,C1005,C1009,C1010,C1011,C1103,C1104,C1105,C1109,C1110,C1111,C1203,C1204,C1205,C1209,C1210,C1211 on TRIG	2
01674712	ECJ1VF1A105Z	CERAMIC CAPACITOR	C12,C11 on MAIN	1
00568789	ECJ1VF1C224Z	CERAMIC CAPACITOR	C33 on MAIN	¹ ₊₄₆
			C213 on MAIN.	
			C102,C106,C108,C112,C116,C156,C202,C206,C208,C212,C302,C306,C308,C312,C402,C406,C408,C412,C502,C506,C508,C512,C602,C606,C708,C712,C802,C806,C808,C812,C902,C906,C908,C912,C1002,C1006,C1008,C1012,C1102,C1106,C1108,C1112,C1202,C1206,C1208,C1212 on TRIG	
01674701	ECJ1VF1E104Z 0.1UF/16VK	CERAMIC CAPACITOR	C511,C369,C371,C376,C373,C375,C368,C335,C383,C377,C512,C505,C381,C372,C77,C304,C305,C306,C307,C308,C309,C310,C312,C313,C314,C302,C349,C316,C367,C317,C318,C319,C320,C321,C322,C323,C322,C323,C325,C327,C302,C349,C316,C367,C317,C318,C319,C320,C321,C322,C323,C325,C327,C384,C429,C428,C393,C445,C508,C507,C391,C390,C389,C388,C387,C386,C385,C502,C618,C504,C506,C509,C510,C513,C514,C515,C516,C517,C600,C606,C607,C611,C612,C503,C13,C148,C29,C27,C26,C25,C24,C23,C22,C21,C20,C19,C31,C14,C32,C73,C74,C76,C9,C501,C95,C98,C114,C123,C134,C135,C137,C140,C146,C15,C53,C71,C70,C69,C68,C67,C65,C61,C60,C59,C58,C57,C56,C30,C54,C43,C35,C36,C37,C38,C55,C42,C87,C45,C46,C47,C48,C300,C51,C80,C41,C276,C284,C251,C282,C78,C279,C153,C285,C275,C274,C272,C270,C260,C253,C252,C280,C294,C299,C3,C298,C297,C283,C295,C286,C293,C292,C291,C290,C289,C288,C287,C296,C170,C156,C162,C163,C281,C167,C222,C171,C174,C175,C178,C179,C180,C183,C185,C217,C166,C186,C6,C216,C215,C214,C210,C192,C202,C199,C196,C206,C190,C4 on MAIN. C401,C442,C443,C444,C445, on MASTER. C307,C304,C305,C308,C309,C306,C310,C302,C312,C313,C311 on PANEL-L. C203,C202 on PANEL-U. C63,C73,C23,C72,C70,C22,C64,C21,C91,C208,C97,C96,C95,C19,C18,C84,C85,C90 on COAXIAL. C11,C1,C2,C3,C4,C5,C10,C6 on LCD CN. C107,C103,C102,C117,C110,C105,C106,C108,C118,C109 on VOLUME. C113,C114,C138,C139,C148,C168,C169,C172,C173,C174,C175,C176,C177,C178,C179,C180,C181,C182,C183,C185,C213,C214,C313,C314,C413,C414,C513,C514,C613,C614,C713,C714,C813,C814,C913,C914,C1013,C1014,C1113,C1114,C1213,C1214 on TRIG	²¹⁸ ₊₁₈ ⁺⁸ ₊₁₆ ⁺⁴² ₊₁₀ ⁺² ₊₁₁
01675278	GRM39CH101J50PT	CERAMIC CAPACITOR	C225,C226,C227,C228,C230,C224,C232,C90,C231,C229,C223,C110,C108,C104,C97,C91,C86,C411,C233,C93,C439,C362,C364,C234,C410,C400,C413,C414,C415,C416,C417,C418,C419,C361,C421,C635,C641,C640,C639,C638,C420,C636,C365,C634,C633,C624,C623,C622,C621,C440,C637,C246,C235,C236,C237,C238,C239,C240,C241,C242,C243,C412,C245,C348,C247,C248,C344,C347,C244,C345,C250,C343,C267,C266,C265,C264,C263,C262,C259,C258,C257,C346 on MAIN. C405,C410,C415,C420,C425, on MASTER. C86,C79,C74,C65 on COAXIAL. C24,C100,C101,C107,C115,C150,C154,C155,C201,C207,C301,C307,C401,C407,C501,C507,C600,C601,C700,C707,C800,C801,C807,C815,C901,C907,C1001,C1007,C1101,C1107,C1201,C1207 on TRIG	⁸² ₊₄ ⁺¹⁰ ₊₃₂
00567945	GRM39B103K50PT	CERAMIC CAPACITOR	C351,C117,C326,C105,C630,C644,C350 on MAIN	7
# 03343034	EEE0JA221WP	CHEMICAL CAPACITOR	C608,C609 on MAIN	2

CAPACITOR					
02345101	RV2-16V100M-R	CHEMICAL CAPACITOR	C169,C249,C278,C277,C211,C197,C195,C19 3,C188,C172,C168,C610,C164,C177,C152,C7 ,C1,C642,C631,C625,C402,C613,C301,C427, C159,C401,C394,C370,C334,C333,C331,C61 9,C62,C101,C94,C92,C88,C113,C63,C16,C50 ,C44,C40,C39,C28,C10,C161,C79,C8,C144, +1 +2 +1 +3 +2 +1 +2	59 +2 +1 +3 +2 +1 +2	
02345145	RV2-16V101M-R	CHEMICAL CAPACITOR	C141,C119,C139,C136,C133,C132,C126,C12 5,C122 on MAIN. C303,C301 on PANEL-L. C201 on PANEL-U. C57,C71 on COAXIAL. C13 on LCD CN,C104,C101 on VOLUME. C184,C190,C191 on TRIG	6	
02345134	RV2-16V470M-R	CHEMICAL CAPACITOR	C184,C181,C115,C118,C102,C109 on MAIN C402,C406,C411,C416,C421, on MASTER. C75,C89,C88,C87,C80,C66 on COAXIAL	6 +1 4	
02345067	RV2-25V4R7M-R	CHEMICAL CAPACITOR	C120 on MAIN. C7,C8,C9 on LCD CN	1 +3	
01899223	ECHU1H102JX5	POLYEST. CAPACITOR	C403,C408,C413,C418,C423, on MASTER. C67,C76,C92,C81 on COAXIAL	4 +6	
01898423	ECHU1H222JX5	POLYEST. CAPACITOR	C116,C103 on MAIN	2	
01784123	ECHU1H471JX5	POLYEST. CAPACITOR	C99,C111 on MAIN. C404,C409,C414,C419,C424, on MASTER. C82,C68,C93,C77 on COAXIAL	2 +4 +6	
02129534	ECJ1VB1H102K	CERAMIC CAPACITOR	C426,C324,C261,C518,C72,C422,C52,C5,C1 8,C615,C614,C601,C519,C425 on MAIN. C407,C412,C417,C422,C427, on MASTER. C14,C94,C83,C78,C69,C17,C16,C15 on COAXIAL	14 +8 +6	
INDUCTOR, COIL, FILTER					
01565578	N1608Z601T01	FERRITE-BEAD	L105,L6,L9,L10,L11,L12,L14,L104,L103 on MAIN. L401,L403,L405,L407,L409, on MASTER. L67,L80,L79,L77,L74,L72,L81,L68,L78,L66,L 65,L70,L83,L76,L82 on COAXIAL. L1,L2,L3,L4,L5,L6,L7,L8,L9,L10,L11,L12,L1 3,L14,L15,L16,L17,L18,L19,L20,L21,L22,L23 ,L24,L25,L26,L27,L28,L29,L30,L31,L32,L33, L34,L35,L36,L37,L38,L39,L40,L41,L42,L43,L 44,L45,L46,L47,L48 on TRIG	9 +15 +8 +48	
02891034	N2012ZP121T	FERRITE-BEAD	L2,L1,L3,L300 on MAIN	4	
CRYSTAL, RESONATOR					
02673267	CX-49G 5MHZ	CRYSTAL	X1 on MAIN	1	
02672401	SG-8002JC 67.7376MHZ PC	CRYSTAL	X2 on MAIN	1	
ENCODER					
02671212	EVE GB1 F15 24B	ROTARY ENCODER	EN201 on PANEL-U	1	
CONNECTOR					
#	03349290	10FMN-BMT-A-TFT	CONNECTOR	CN37 on MAIN. CN6 on LCD CN	1 +1
#	03349301	26FMN-BMT-A-TFT	CONNECTOR	CN33 on MAIN	1
	02671201	26FMN-STK	CONNECTOR	CN401 on MASTER	1
#	03349312	28FMN-BMT-A-TFT	CONNECTOR	CN36,CN38 on MAIN	2
	02454245	28FMN-SMT-TF	CONNECTOR	CN4 on COAXIAL	1
#	03452945	28FMN-STK-A	CONNECTOR	CN201 on PANEL-U	1
#	03349323	30FMN-BMT-A-TFT	CONNECTOR	CN34 on MAIN	1
#	03452934	30FMN-STK-A	CONNECTOR	CN101 on VOLUME	1
#	03349334	38FMN-BMT-A-TFT	CONNECTOR	CN35 on MAIN	1
	03126034	38FMN-STK-A	CONNECTOR	CN301 on PANEL-L	1
#	03349345	40FMN-BMT-A-TFT	CONNECTOR	CN20 on MAIN	1
	03126090	40FMN-SMT-A-TF	CONNECTOR	CN5 on TRIG	1
#	03346967	52437-2491	CONNECTOR	CN1 on LCD CN	1
#	03346956	52746-1690	CONNECTOR	CN2 on LCD CN	1
#	03232001	53493-0807	CONNECTOR	CN16 on MAIN	1
	02906545	B7B-PH-SM3-TB	CONNECTOR	CN6 on MAIN	1
WIRING, CABLE					
△ #	03453512	W1	WIRING	CN6 on MAIN to CN2 on PowerSuply Unit	1
	02789112	BNCD-P=1.00-K-10-100	BAN CARD	CN37 on MAIN to CN6 on LCD-CN	1
#	03453656	BNCD-P=1.00-K-26-90	BAN CARD	CN33 on MAIN to CN401 on MASTER	1
#	03453667	BNCD-P=1.00-K-28-50	BAN CARD	CN38 on MAIN to CN4 on COAXIAL	1
#	03453689	BNCD-P=1.00-K-28-90	BAN CARD	CN36 on MAIN to CN201on PANEL-U	1
#	03453690	BNCD-P=1.00-K-30-160	BAN CARD	CN34 on MAIN to CN101 on VOLUME	1
#	03453701	BNCD-P=1.00-K-38-170	BAN CARD	CN35 on MAIN to CN301 on PANEL-L	1
#	03453723	BNCD-P=1.00-K-40-60	BAN CARD	CN20 on MAIN to CN5 on TRIG	1

TRANSFORMER

02019478	(7KQ5) 19832A	PULSE TRANS	T1 on COAXIAL	1
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SCREW

	40011090	SCREW 3x6	BINDING TAPITTE B BZC	25
	40011067	SCREW 3x8	BINDING TAPITTE B FE ZC	12
	40011312	SCREW 3x8	BINDING TAPITTE P BZC	29
	40019123	SCREW 3x8	BINDING TAPITTE S BZC	4
	40011156	SCREW 3x8	FLAT TAPITTE B BZC	2
	40454045	SCREW 3x8	FLAT TAPITTE NI FLANGE SOCKET	12
	40237101	SCREW M3x8	PAN MACHINE W/SW+PW FE BZC	11
	40011289	SCREW 3x10	BINDING TAPITTE P ZC	4
	40011123	SCREW 4x8	BINDING TAPITTE B BZC	2
△	40011378	SCREW M4x8	BINDING TAPITTE S FE BZC	1
	40238145	SCREW M5x12	TRUSS BZC	4
△	40011956	PLAIN WASHER 3x10x0.8	ZC	3

PACKING

#	03453745	PACKING CASE		1
#	03566378	ACCESSORY PAD		1
#	03566356	SIDE PAD L		1
#	03566367	SIDE PAD R		1

MISCELLANEOUS

	40122812	ACETATE TAPE NITTO #5 BLK	W15MM 30M	5	
	02567267	BATRY HOLDER	BCR20H4	1	
△	40013812	CAUTION SEAL	IEC(100V/117 ONLY) #142	1	
#	03566423	DISPLAY CUSHION		1	
	40122556	DOUBLE-FACED TAPE NITTO #575X	W30MM 30M	2	
	40122923	DOUBLE-FACED ADHESIVE TAPE NITTO #501F	W20MM 20M	2	
	01235378	FOOT		4	
	12199584	GROUNDING TERMINAL	M1698	2	
				TER2,TER1 on MAIN. TER401,TER402,TER403 on MASTER. TER5,TER4,TER3 on COAXIAL. TER7,TER8,TER9 on TRIG	+3
△	02894367	INSULATING COVER	SW-PS	1	
△	# 03453890	INSULATING SHEET		1	
△	02567234	LITHIUM BATTERY	CR2032	1	
△	# 03560956	SHIELD SHEET LCD		1	

ACCESSORIES (STANDARD)

#	72458934	OWNER'S MANUAL	JAPANESE	1
#	72459334	OWNER'S MANUAL	ENGLISH	1
△	03340956	AC CORD SET	100V YA-101/YP-3NB	1
△	00894378	AC CORD SET	120V SP301+IS14 SJT18/3	1
△	00894389	AC CORD SET	230V SP22+IS14 H05VV-F3G1.0	1
△	00907001	AC CORD SET	240VE KP-610 GTTBS-3 KS-31A	1
△	23495124	AC CORD SET	240VA SC-144-JO1 ES303-10HMA	1
	40232334	WARRANTY CARD	(JAPAN ONLY)	1

CHECKING THE VERSION NUMBER



In step 2, if a screen different from the one shown below is displayed, it means the program version is at 2.00 or later. If this happens, use the procedure described in the TDW-20 Service Notes (#17058576E0) to verify the version.

1. Simultaneously hold down the [EFFECTS ON/OFF], [AMBIENCE], and [MASTER COMP] buttons and turn on the power.
2. Press the [TOOL] button after start up, and the following appears in the LCD display.



3. Next, press the [F4] button, and the version number appears in the screen.

LOCAL VERSION				
FLASH	1.04	R0049		
SRAM	1.00			
IROM	1.00			
IROM(T)	1.00			

VERSION VH AD WIN/TAB

FLASH: Program version number

SRAM: Version number for initial SRAM settings values.

IROM: MAIN CPU version number

IROM(T): TRIG CPU version number

4. Under normal circumstances, confirm only the program version number. Turn off the power to the unit after confirming the information.



The screens depicted in the procedures of **INITIALIZING (FORMATTING) THE MEMORY CARD** and **USERS DATA SAVE AND LOAD** described below differ in some ways when the program version is 1.06 or later, but the procedures themselves are the same.

INITIALIZING (FORMATTING) THE MEMORY CARD



Cards supported by TD-20 are 3.3 V CompactFlash cards with the capacity of 16 MB to 512 MB.

1. Insert the memory card in the slot.

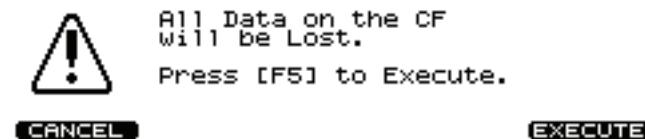
2. Press the [CARD] button; the following appears in the LCD display.

CARD MENU



3. Press the [F4 FORMAT] button, then press the [F5 FORMAT] button; the following appears in the LCD display.

CARD FORMAT



4. To format, press the [F5 EXECUTE] button. The formatting is executed. To cancel formatting, press the [F1 CANCEL] button. When formatting is finished, "Completed!" temporarily appears, and The LCD display returns to its original state.

USERS DATA SAVE AND LOAD



Cards supported by TD-20 are 3.3 V CompactFlash cards with the capacity of 16 MB to 512 MB.

Data Backup

Save all user data in the User area to a memory card.

User data includes the following.

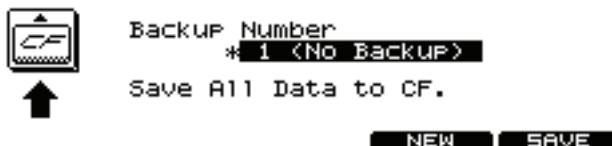
- Drum kits
- Percussion sets
- Patterns
- Setup

1. Insert the memory card in the slot.
2. Press the [CARD] button; the following appears in the LCD display.

CARD MENU

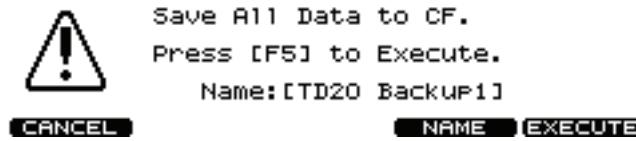


3. Press the [F1 SAVE] button; the following appears in the LCD display.

CARD SAVE

At this point, the [+/-] buttons or [VALUE] dial can be used to change the backup number for the data to be saved (up to a maximum of 8 numbers can be saved simultaneously).

4. Press the [F5 SAVE] button; the following appears in the LCD display.

CARD SAVE

5. To execute the save, press the [F5 EXECUTE] button.

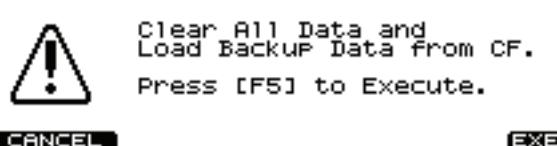
The save is executed.

To cancel the save, press the [F1 CANCEL] button.

When the save is finished, "Completed!" temporarily appears, and

The LCD display returns to its original state.

4. Press the [F5 LOAD] button; the following appears in the LCD display.

CARD LOAD

5. To execute the load, press the [F5 EXECUTE] button.

Loading is executed.

To cancel loading, press the [F1 CANCEL] button.

When loading is finished, "Completed!" temporarily appears, and

The LCD display returns to its original state.

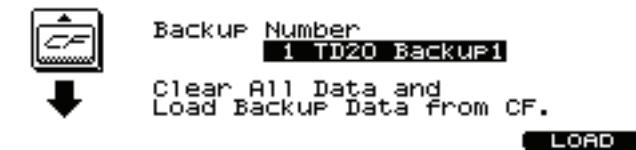
Data Restore

Use the Data Backup to restore the saved user data to the TD-20's User Area

1. Insert the memory card containing the saved data in the slot.
2. Press the [CARD] button; the following appears in the LCD display.

CARD MENU

3. Press the [F2 LOAD] button; the following appears in the LCD display.

CARD LOAD

At this point, the [+/-] buttons or [VALUE] dial can be used to select the backup number in the Data Backup.

TEST MODE



Cards supported by TD-20 are 3.3 V CompactFlash cards with the capacity of 16 MB to 512 MB.



With version 2.00 and after, the procedure for starting the Test mode is changed, and Test-mode items for the TDW-20 as a single unit have also been added.

For more details, refer to the TDW-20 Service Notes (#17058576E0).

Required Equipment

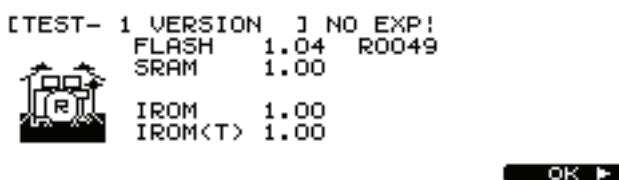
- FD-7
- Monaural cable (for FD-7)
- PD-7
- PAD cable (stereo type)
- Drum stick
- MIDI cable
- FS-5U x2 (foot switch)
- PCS-31 cable
- CompactFlash (must be formatted for TD-20)
- Headphones
- Monitor speakers x2 (DS-90 or other with coaxial inputs)
- COAXIAL cable
- TD-20 expansion board (Note: expansion board sold separately)

Preparation

1. Insert CompactFlash in slot.
2. Install expansion board in TD-20 (Note: Perform this only if the optional expansion board is on hand).



If no expansion board is installed, "NO EXP!" appears in the LCD display in each test mode category; however, this has no effect on any test except [TEST-3 EXP-BOARD].



Entering Test Mode



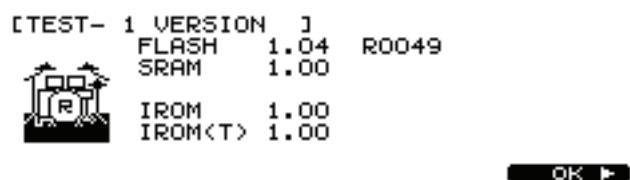
The contents of the user memory are deleted upon entering Test mode. Be sure to have backed up the user memory using the prescribed save procedures before entering Test mode. After finishing Test mode, be sure complete the procedures by performing the "Factory Reset."

1. Simultaneously hold down the [PATTERN], [PLAY], and [TEMPO] buttons and turn on the power.

2. When the "Roland" logo appears in the LCD display during startup, release the pressed buttons and then press the [+] button.

Roland

3. Test mode starts up, and the following appears in the LCD display.



Exiting Test Mode

It is possible to quit Test mode at any stage by switching off the power. However, always complete the procedure by performing the Factory Reset.

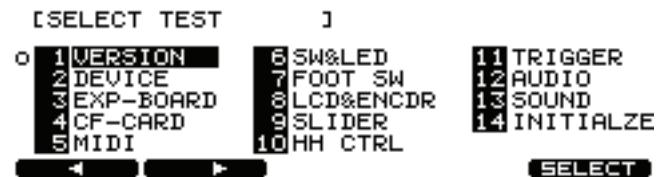
To Skip a Test Category

To skip to the next test category: hold down the [SHIFT] button and press the [F5] or [+] button

To jump to the previous test category: hold down [SHIFT] button and press the [F4] or [-] button

To skip to a specific test category: hold down the [SHIFT] button and press the [EXIT] button to shift to the SELECT screen.

Use the cursor to select the category, then press the [F5 SELECT] button.



A circle appears to the left of completed test categories.

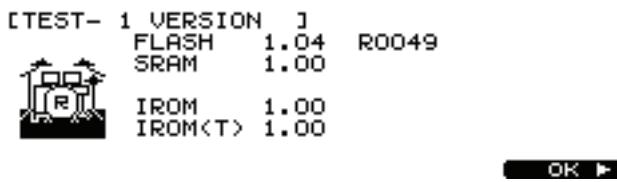
Test Categories

1. Version Display [TEST - 1 VERSION]
2. Device Test [TEST - 2 DEVICE]
3. Expansion Test [TEST - 3 EXP-BOARD]
4. CompactFlash Test [TEST - 4 CF-CARD]
5. MIDI Test [TEST - 5 MIDI]
6. SW/LED Test [TEST - 6 SW&LED]
7. FOOT SW Test [TEST - 7 FOOT SW]
8. LCD/ENCODER Test [TEST - 8 LCD&ENCDR]
9. SLIDER Test [TEST - 9 SLIDER]
10. HH CTRL Test [TEST - 10 HH CTRL]
11. TRIGGER Test [TEST - 11 TRIGGER]
12. AUDIO IN/OUT Test [TEST - 12 AUDIO]
13. Sound Test [TEST-13 SOUND]
14. FACTORY RESET [TEST-14 INITIALZE]

Detailed Tests

1. Version Display [TEST - 1 VERSION]

- This checks the software version



FLASH: Program version number

SRAM: Version number for initial SRAM settings values.

IROM: MAIN CPU version number

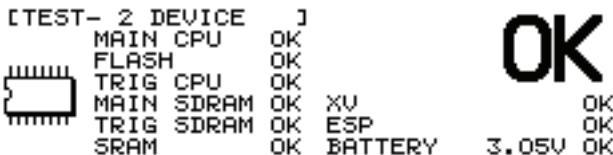
IROM(T): TRIG CPU version number

- Under normal circumstances, confirm only the program version number. Press the [F5 (OK)] button to advance to the next test

2. Device Test [TEST - 2 DEVICE]

- This test is performed automatically.

The determination of "OK" or "NG" (no good, i.e. fail) appears to the right of each test category; if all checks are OK, the procedure automatically advances to the next test.



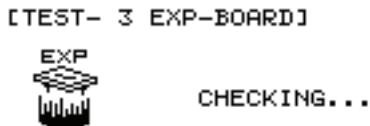
Test Categories

- MAIN CPU: Checksum check
- FLASH: Checksum check
- TRIG CPU: Checksum check
- MAIN SDRAM: Confirms reading/writing
- TRIG SDRAM: Confirms reading/writing
- SRAM: Confirms reading/writing
- XV: Confirms reading/writing of WAVE ROM, DSP RAM, DRAM
- ESP: Confirms reading/writing of DSP RAM, DRAM
- BATTERY: Battery voltage check

- If even one check fails, the procedure does not advance to the next test; press the [F3 RETRY] button to carry out the test again.

3. Expansion Test [TEST - 3 EXP-BOARD]

- A read/write test of the expansion board is performed automatically.



- If all tests result in OK, the procedure automatically advances to the next test category.

- If even one check fails, the procedure does not advance to the next test; press the [F3 RETRY] button to carry out the test again.



The following appears in the LCD display if no expansion board is installed. Hold down the [SHIFT] button and press the [F5] button to advance to the next test.

[TEST- 3 EXP-BOARD] NO EXP!

EXP NO EXPANSION BOARD

Power off and set EXPANSION BOARD

4. CompactFlash Test [TEST - 4 CF-CARD]

- A detection and read/write test of the compactFlash is performed automatically.
- If the test results in OK, the following screen appears in the LCD display; remove the CompactFlash

[TEST- 4 CF-CARD]



Eject the card.

- When the unit detects that the CompactFlash has been removed, the procedure automatically advances to the next test category.
- If detection or the read/write test of the compactFlash check fails, or if no CompactFlash has been inserted, the procedure does not advance to the next test; press the [F3 RETRY] button to carry out the test again.

5. MIDI Test [TEST - 5 MIDI]

- When a MIDI cable is connecting the MIDI IN and MIDI OUT connectors, signals are detected, and the following appears in the LCD display (ON-LINE OK).

Before Connecting



After Connecting

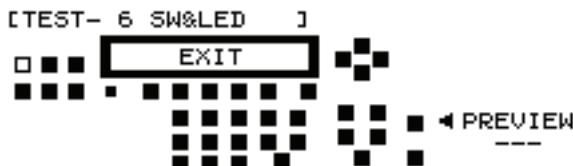


- Disconnect the MIDI cable and confirm the signal is off (OFF-LINE OK); the procedure automatically advances to the next test.

6. SW/LED Test [TEST - 6 SW&LED]

- Press each panel switch one at a time; confirm that the switch name and position appears in the display, and the corresponding sound plays. Also confirm that the corresponding light goes off.

Example of the [EXIT] button being pressed



LEDs with no corresponding switches are turned off with the following switches.

TRIGGER METER LEDs: Turned off one by one from the top by pressing the [F1] button

Left column of seven-segment LED: The dots are turned off one by one by pressing the [F2] button

Center column of seven-segment LED: All of the dots go off simultaneously by pressing the [F3] button

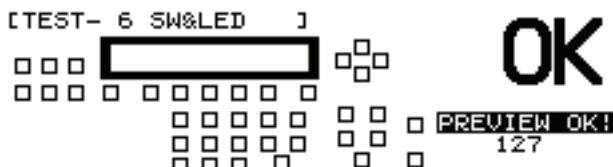
Right column of seven-segment LED: All dots go off simultaneously by pressing the [F4] button

GROUP FADERS Upper LEDs: Turned off by the [+] button

GROUP FADERS Lower LEDs: Turned off by the [-] button

CompactFlash LED: Turned off by the [PREVIEW] button

- The velocity check is simultaneously performed with the [PREVIEW] button. Tap the [PREVIEW] button strongly; confirm that "127" appears in the lower right of LCD display.



- If all tests result in "OK," the procedure automatically advances to the next test category.



If two or more switches are pressed simultaneously, the test is cancelled.

7. FOOT SW Test [TEST - 7 FOOT SW]

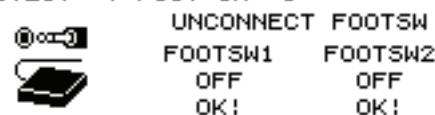
- Connect two FS-5Us to the PCS-31, one to the white and on to the red plugs, and connect the black plug to the FOOTSW INPUT.
- Press each FS-5U, one at a time; the corresponding location in the LCD display should show "ON/OFF."



If both foot switches are on simultaneously, "SHORT!" appears in the display; "OK" is not displayed.

When both foot switches show "OK," the following appears in the LCD display.

[TEST- 7 FOOT SW]



- When the cable is disconnected from the INPUT the procedure automatically advances to the next test.

8. LCD/ENCODER Test [TEST - 8 LCD&ENCDR]

- Slowly rotate the [VALUE] dial to the right.
- Confirm that the arrow in the middle of the LCD display moves slowly to the right, while the screen contrast darkens.
- When the meter is rotated fully to the right, "RIGHT!" appears in the display, and then changes to "OK!"
- Next, slowly rotate the [VALUE] dial to the left.
- Confirm that the arrow in the middle of the LCD display moves slowly to the left, while the screen contrast lightens.
- When the meter is rotated fully to the left, "LEFT!" appears in the display, and then changes to "OK!"

[TEST- 8 LCD&ENCDR]

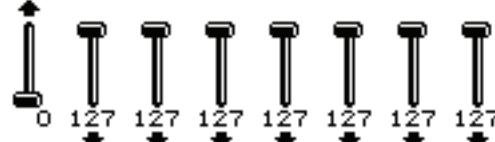


- Next, press the [F1(DARK)] button. Confirm all dots in the LCD are lit.
- Next, press the [F1(BRIGHT)] button. Confirm all dots in the LCD go off.
- Press the [F5(OK)] button to advance to the next test.

9. SLIDER Test [TEST - 9 SLIDER]

- Move each GROUP FADER up and down one at a time.
- Confirm that when the FADER is all the way up, the corresponding value in the LCD is "127," and when the FADER is all the way down, the corresponding value in the LCD is "0." Also confirm that this is accompanied by the corresponding pitch changes.

[TEST- 9 SLIDER]



- When all FADER changes are detected, the procedure automatically advances to the next test.

10. HH CTRL Test [TEST - 10 HH CTRL]

- Connect a FD-7 to the HH CTRL INPUT with a monaural cable.
- Gradually press the FD-7 down and confirm that the meter in the LCD gradually decreases, with the meter at "0" when the pedal is fully pressed down.

Here, the following appears in the LCD display.

[TEST-10 HH CTRL]
 PEDAL SWITCH
 UNPLUG►OK! ON ►OK!
 FD-7 OPEN ►OK!
 CLOSE ►OK! OFF►---
 -----:
PEDAL SWITCH

[TEST-12 AUDIO]
 MUTE DIR1 DIR2 DIR3 DIR4
 COAXIAL DIR5 DIR6 DIR7 DIR8
[Change Outputs] PLUG►OK! UNPLUG►---
 -----:

3. Release the FD-7, and disconnect the cable from the HH CTRL INPUT; the procedure automatically advances to the next test.



If a stereo cable is used, the procedure does not advance to the next test.
Be sure to use a monaural cable.

11. TRIGGER Test [TEST - 11 TRIGGER]

1. Connect a PD-7 to each TRIGGER INPUT with a pad cable and confirm the following tests.
 - Strike the PD-7 head. The corresponding numerals in the HEAD row in the LCD change to “-”. A high pitch is generated simultaneously.
 - Strike the PD-7 rim. The corresponding numerals in the RIM row in the LCD change to “-”. A normal pitch is generated simultaneously (INPUT 2-6 and 12-15 only).
 - Choke the PD-7 rim. The corresponding numerals in the SWITCH row in the LCD change to “-”. A low pitch is generated simultaneously.

[TEST-11 TRIGGER]
 HEAD
 - - 3 4 5 6 7 8 9 10 11 12 13 14 15
 RIM
 - - 3 4 5 6 12 13 14 15
 SWITCH
 - - 3 4 5 6 7 8 9 10 11 12 13 14 15



The numerals may change to “-” when the plug is connected.
If this occurs, confirm that the corresponding numbers are displayed momentarily when the pad is struck or choked.



If two or more inputs respond, the following highlighted numerals appear in the LCD.

[TEST-11 TRIGGER]
 HEAD
 - **2** 3 4 5 6 7 8 9 10 11 12 13 14 15
 RIM
 - - 4 5 6 12 13 14 15
 SWITCH
 - - 3 4 5 6 7 8 9 10 11 12 13 14 15

2. After confirming all inputs, press the [F5(OK)]; the procedure automatically advances to the next test.

12. AUDIO IN/OUT Test [TEST - 12 AUDIO]

1. Connect the white and red plugs of the PCS-31 cable to DIRECT OUT 1 and DIRECT OUT 5, and connect the black plug to MIX IN.
2. Connect COAXIAL OUT and MASTER OUT to the monitor.
3. Connect a pair of headphones to the PHONES jack.
4. Turn all the volumes for MIX IN, PHONES, and MASTER to the right.
5. The LCD display shows that MUTE is selected, as shown below.
Confirm that sound is being output from COAXIAL OUT, MASTER OUT, and PHONES.

6. Press the [F2 (>)] button.
Confirm that “DIR1” and “DIR5” are selected in the LCD display and that a sine wave is being output only from MASTER OUT L and R.
7. Remove the plugs connected to DIRECT OUT 1 and 5 and connect them to DIRECT OUT 2 and 6 respectively, then press the [F2 (>)] button.
8. Confirm that “DIR2” and “DIR6” are selected in the LCD display and that a sine wave is being output only from MASTER OUT L and R.
9. In the same manner, switch the plug connections to confirm “DIR3” and “DIR7” and then “DIR4” and “DIR8”.
10. Press the [F2 (>)] button.
11. Confirm that “COAXIAL” is selected in the LCD display and that a sine wave is being output only from COAXIAL OUT.
12. Press the [F2 (>)] button.
13. Confirm that “PHONES” is selected in the LCD display and that a sine wave is being output only from PHONES.



Be careful with volume levels.

14. Disconnect the plug from MIX IN.
The procedure automatically advances to the next test.

Signal Path

DIR 1, 2, 3, 4 ---> MIX_IN Lch ---> MASTER Lch
 DIR 5, 6, 7, 8 ---> MIX_IN Rch ---> MASTER Rch

This path is confirmed simultaneously.

13. Sound Test [TEST-13 SOUND]

1. Confirm that sound is played (sound of hand striking).
“OFF” appears in the LCD display.
2. Press the [F1(PLAY)] button.
The LCD display changes to “ON” and a numeral “1--8.”
3. The volume gradually decreases as the number changes.
Confirm that each sound plays correctly.



The sound with noise and short sounds, it is failure.

4. After confirmation is completed, press the [F5(OK)] button to advance to the next test.

[TEST-13 SOUND]



STOP

8

OK

14. FACTORY RESET [TEST-14 INITIALZE]

- This performs an SRAM read/write test and Factory Reset.
- Press the [F1(EXECUTE)] button to start the SRAM test.

[TEST-14 INITIALZE]



Checking SRAM.

- If the SRAM test results in OK, Factory Reset is then executed. If the SRAM test results in failure (NG), "SRAM NG!" appears in the display, and the procedure does not advance to the Factory Reset.
- When Factory Reset is completed, the following appears in the LCD display.
- This completes the test; turn off the power to the unit.

[TEST-14 INITIALZE]



Clear All data and
Load factory Preset completed!
Please POWER OFF!

- If any test has not been performed (including test failures), the following appears in the LCD display (a message indicating that not all tests have been cleared). After confirming the message, turn off the power to the unit to quit the tests. (In this case, the "Factory Reset" is executed.)

[TEST-14 INITIALZE]



Clear All data and
Load factory Preset completed!
Some tests are not cleared yet.
[SHIFT]+[F4] to back or
[SHIFT]+[EXIT] to check list.
◀ PREV

- Remove the expansion board used for the test from the TD-20.

RESTORING THE FACTORY SETTINGS

- Press the [SETUP] button; the following appears in the LCD display.

SETUP



- Press the [F5] button twice; the following appears in the LCD display.

FACTORY RESET



Clear All Data and
Load Factory Preset Data.
Press [F5] to Execute.

CANCEL

EXECUTE

- To execute the Factory Reset, press the [F5 EXECUTE] button. Factory Reset is executed.

To cancel Factory Reset, press the [F1 CANCEL] button.

~~When Factory Reset is finished, "Completed!" temporarily appears, the LCD display returns to its original state, and the procedure is completed.~~

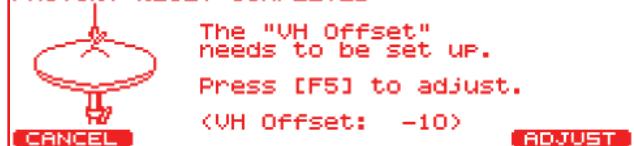


After executing step 3, if the message "Completed!" is displayed briefly and the LCD display then reverts to the original screen, it means the system program is an old version (1.05 or earlier).

In such cases, regardless of the servicing to be performed, update the unit to the latest version (1.06 or later). For more information, check the following section, Updating the System.

- When the factory reset finishes, the VH Offset adjustment screen appears.

FACTORY RESET COMPLETED



- Press the [F1 (CANCEL)] button. The LCD display returns to the Drum kit screen, and the procedure is completed.

SYSTEM SOFTWARE UPDATE PROCEDURE

The TD-20 uses flash memory for the program ROM; update the system using either of the two following methods.



A system program of version 2.00 or later is used when the TDW-20 is installed. When no TDW-20 is used, update using the latest 1.xx-series version.

1. Updating with CompactFlash Using the TD-20's CompactFlash Slot (Recommended)

(Time Required for Procedure): Approximately 2 minutes

2. Updating with MIDI Using a MIDI Sequencer

(Time Required for Procedure): Approximately 1 hour

Updating with CompactFlash



Cards supported by TD-20 are 3.3 V CompactFlash cards with the capacity of 16 MB to 512 MB.

Required Equipment

- UPDATE DATA FOR SERVICE CD-ROM (#17041423)
- PC (Do not use a Macintosh)

- CompactFlash x2
- CompactFlash Reader and Writer



After updating, be sure to perform the "Factory Reset".

If important user data is to be overwritten, save the data (refer to Saving and Loading User Data) before carrying out the update.

Create an Update Card

Create an update card for use by the TD-20.

1. Turn on the power to the PC.
2. Insert a CompactFlash of a minimum 8 MB in a CompactFlash reader/writer connected to the computer, and format the card.
3. Place the UPDATE CD-ROM in the computer, and bring up the "CF" folder on the CD-ROM.
4. Copy all of the files from "CF" on to the CompactFlash card.

Process of Updating the TD-20

1. Insert the newly created update card in the TD-20.
2. Turn on the power to the TD-20, and after the card is recognized, the following confirmation screen appears in the LCD display.



3. To execute the update, press the [F5] button.
The update is executed.
If the update is not to be executed, leave the unit as is and turn off the power.
4. When "TD-20 Update Completed!" appears in the LCD display, the update is completed.
Turn off the power to the TD-20 at this point, then remove the card from the PD-20.
5. Turn on the power to the TD-20 again to carry out Test mode.



If the update is carried out successfully running on the TD-20 (if the data in the TD-20 and the card are identical), the following screen appears in the LCD display.

DELETED

TD-20 Updater
Program data is complete.
So you don't need to update.
Eject card and power on.

Turn off the power to the TD-20 and remove the card.
(A comparison with the internal data indicates that no update is required.)

disks, or equivalent)

- PC (Do not use a Macintosh)
- MIDI cable

Create the Update Disk or Disks

This creates one or more disks for loading SMF data to the sequencer.

1. Turn on the power to the PC.
2. Insert a Zip disk or floppy disk.
3. Place the UPDATE CD-ROM (#17041423) in the computer, and bring up the "MIDI" folder on the CD-ROM.
4. * If using a Zip disk
Copy all 64 SMF data files (from p0001.mid to p0064.mid) from "MIDI".
* If using floppy disks
Copy the 64 SMF data files in "MIDI" to the floppy disks in order of the file names, copying 16 SMF data files at a time to each of the 4 floppy disks.

Disc 1 : p0001.mid -- p0016.mid

Disc 2 : p0017.mid -- p0032.mid

Disc 3 : p0033.mid -- p0048.mid

Disc 4 : p0049.mid -- p0064.mid

Process of Updating the TD-20

1. Use a MIDI cable to connect the sequencer's MIDI OUT to the TD-20's MIDI IN.
2. Insert the newly created SMF data disk in the sequencer.
3. Simultaneously hold down the TD-20's [SETUP] and [REC] buttons and turn on the power to the TD-20.
4. The following screen appears in the LCD display.

TD-20 MIDI Updater

Please send update smf data.

5. After confirming that the sequencer playback mode is not set to loop playback, play back the data in order of the file names to transmit the data.
If using floppy disks, play back Disk 1 until the data is transmitted, then insert Disk 2 and play back the data on that disk, then follow this process with Disk 3 then Disk 4 until all of the data has been transmitted.
The following screen appears in the TD-20's LCD display during reception of MIDI data.

TD-20 MIDI Updater

Receiving : 1 / 64

6. When transmission of all 64 SMF data files is completed, the TD-20 automatically starts writing the data to the internal flash memory.
The following screen appears in the TD-20's LCD display while the data is being written.

TD-20 MIDI Updater

Updating now !



Be absolutely sure not to turn off the power at this time.

If this operation does not finish properly, subsequent MIDI updating will not be possible.

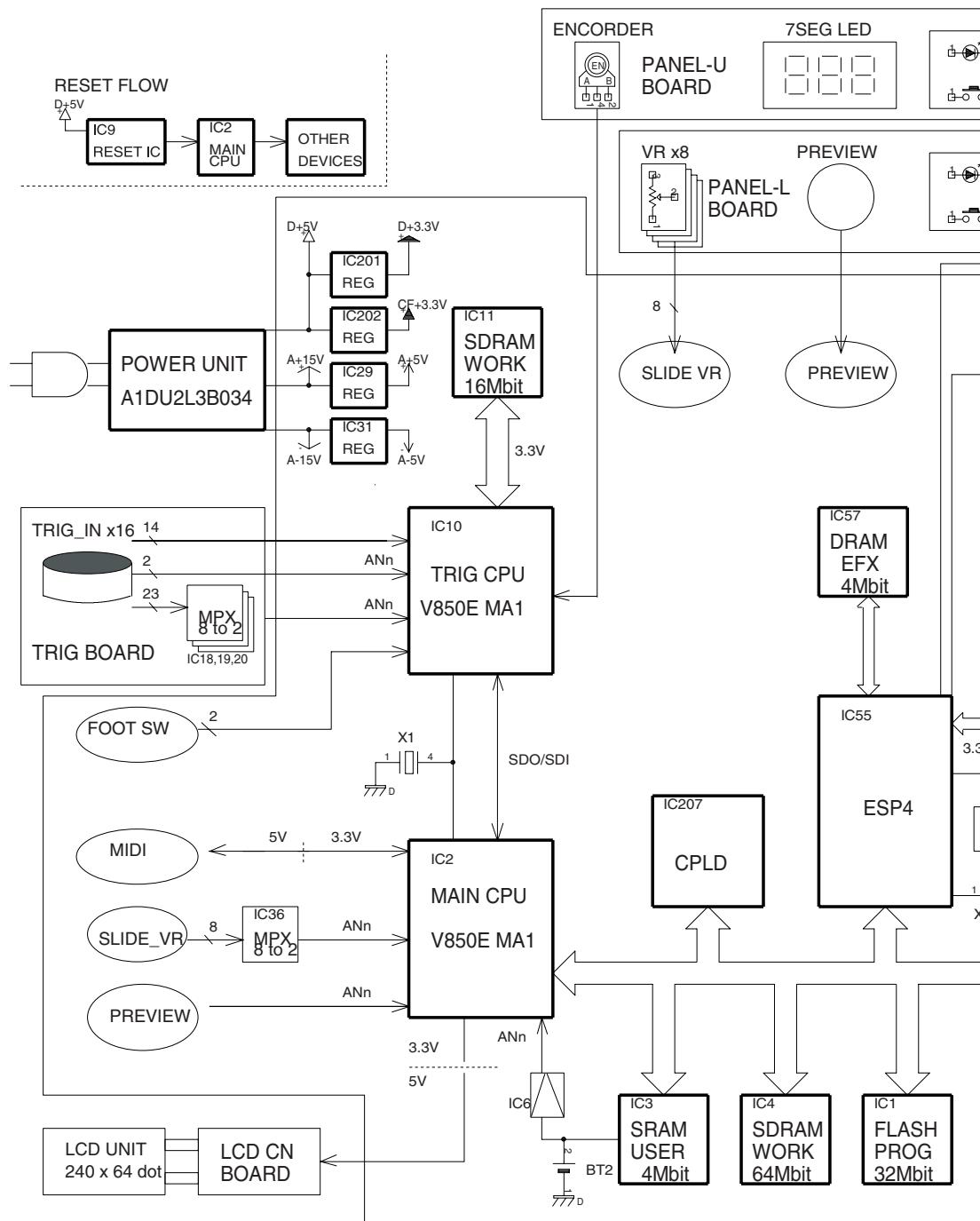
If this occurs, carry out the update using CompactFlash.

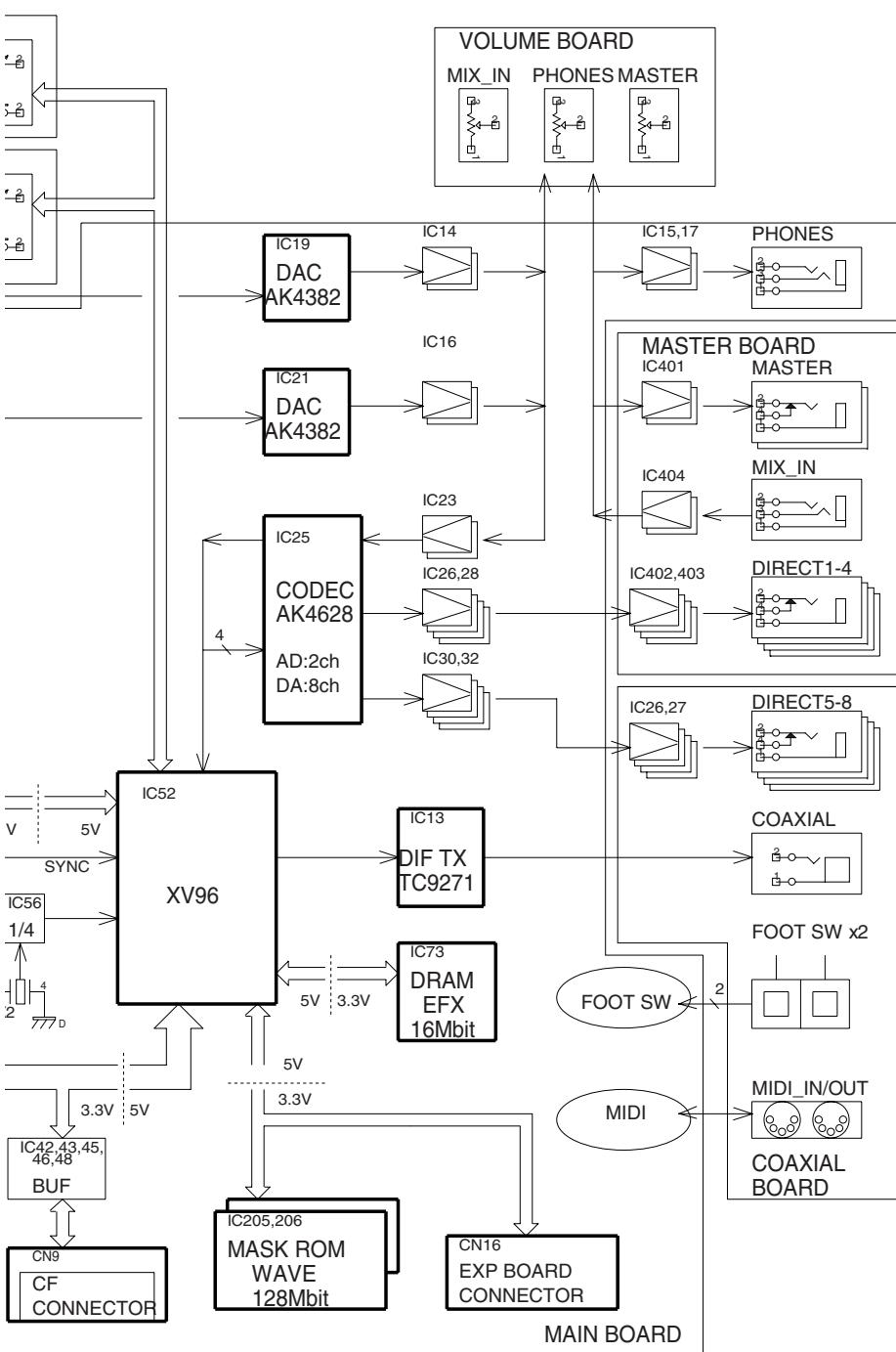
Updating with MIDI

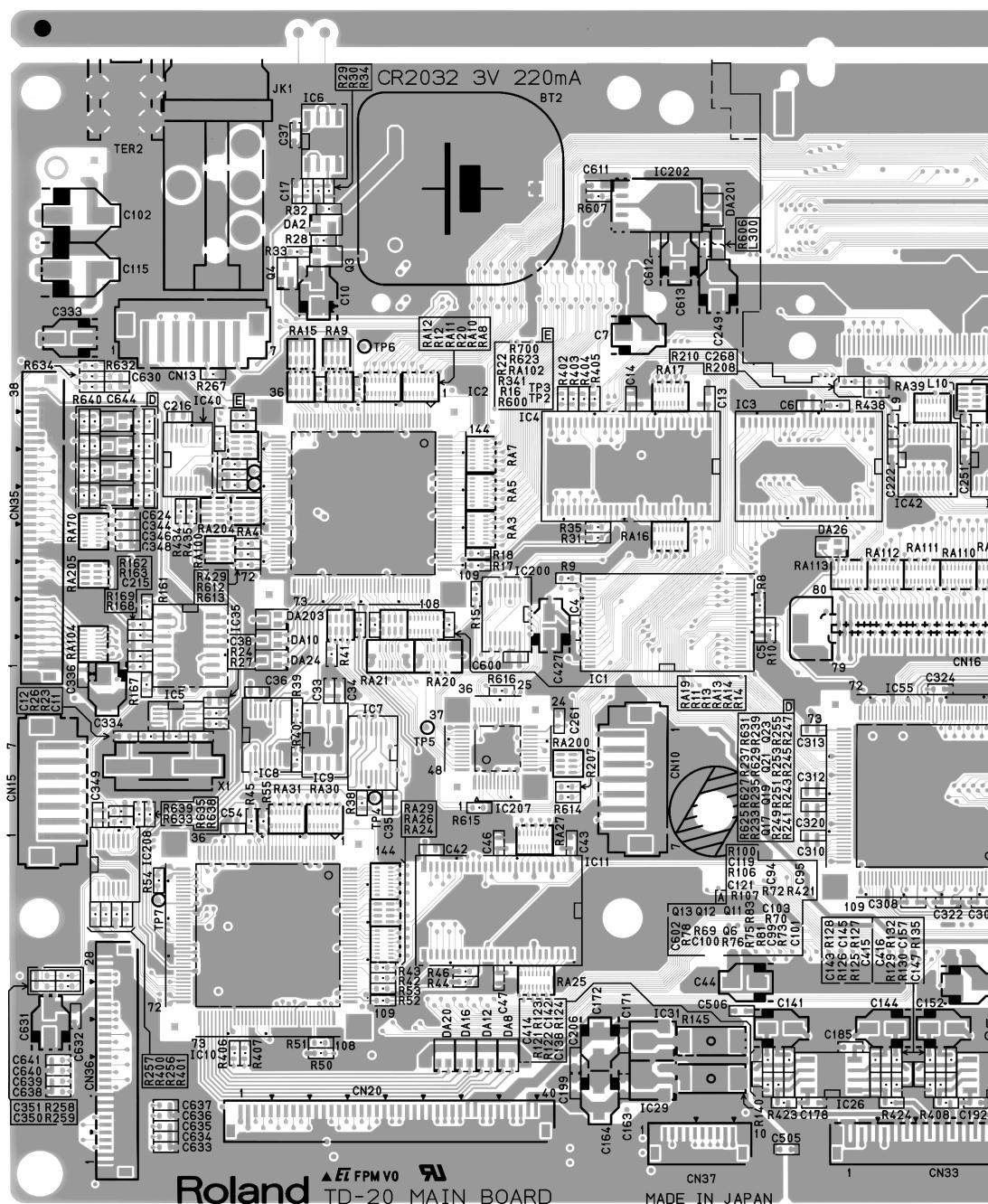
Required Equipment

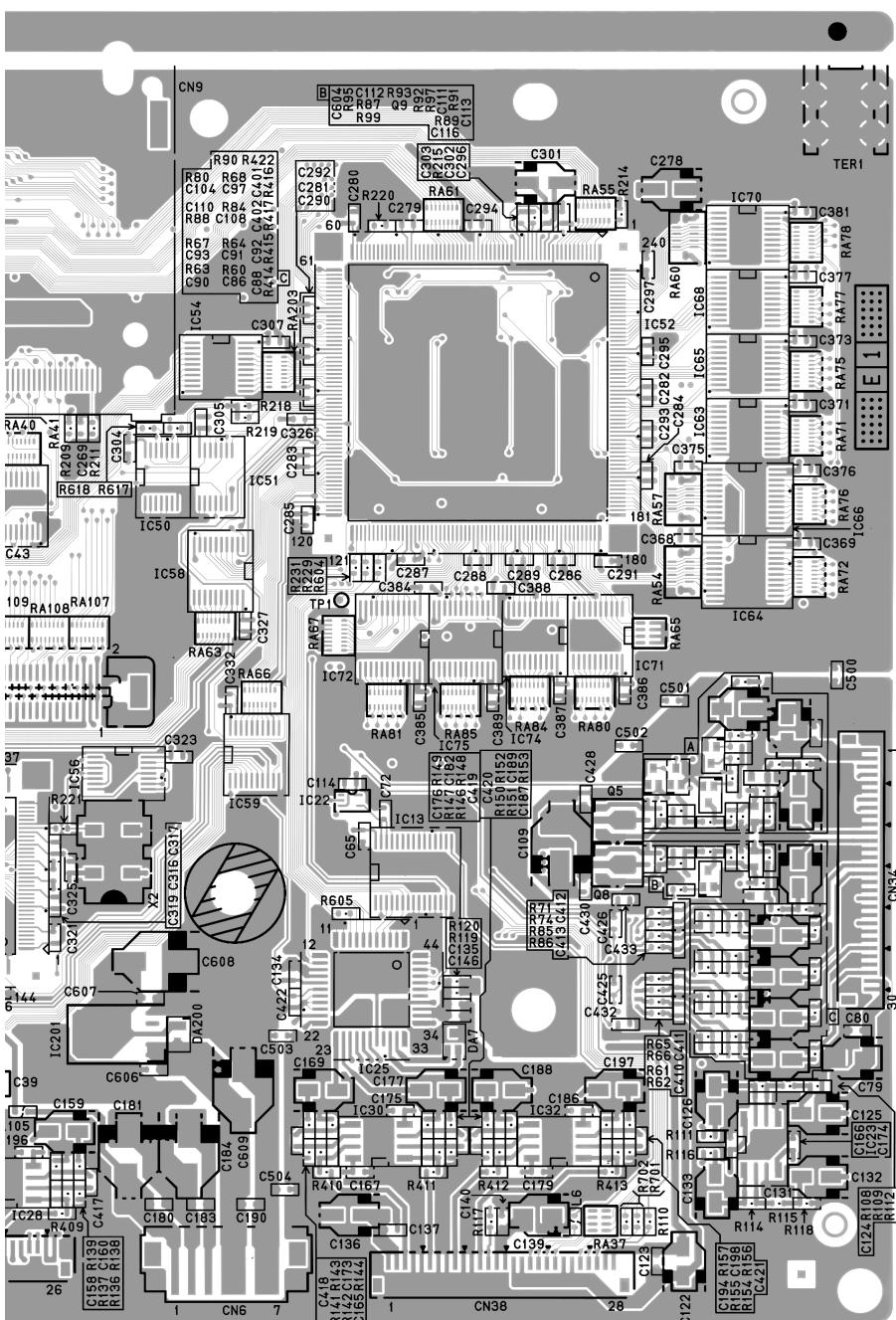
- UPDATE DATA FOR SERVICE CD-ROM (#17041423)
- Sequencer capable of playing back SMF data
- Media that can be used with the above sequencer (1 Zip disk, 4 floppy

-
- 7. When writing of the data to the flash memory is completed, the unit restarts automatically.
 - 8. Turn the power to the TD-20 off and then on again to carry out Test mode.

BLOCK DIAGRAM

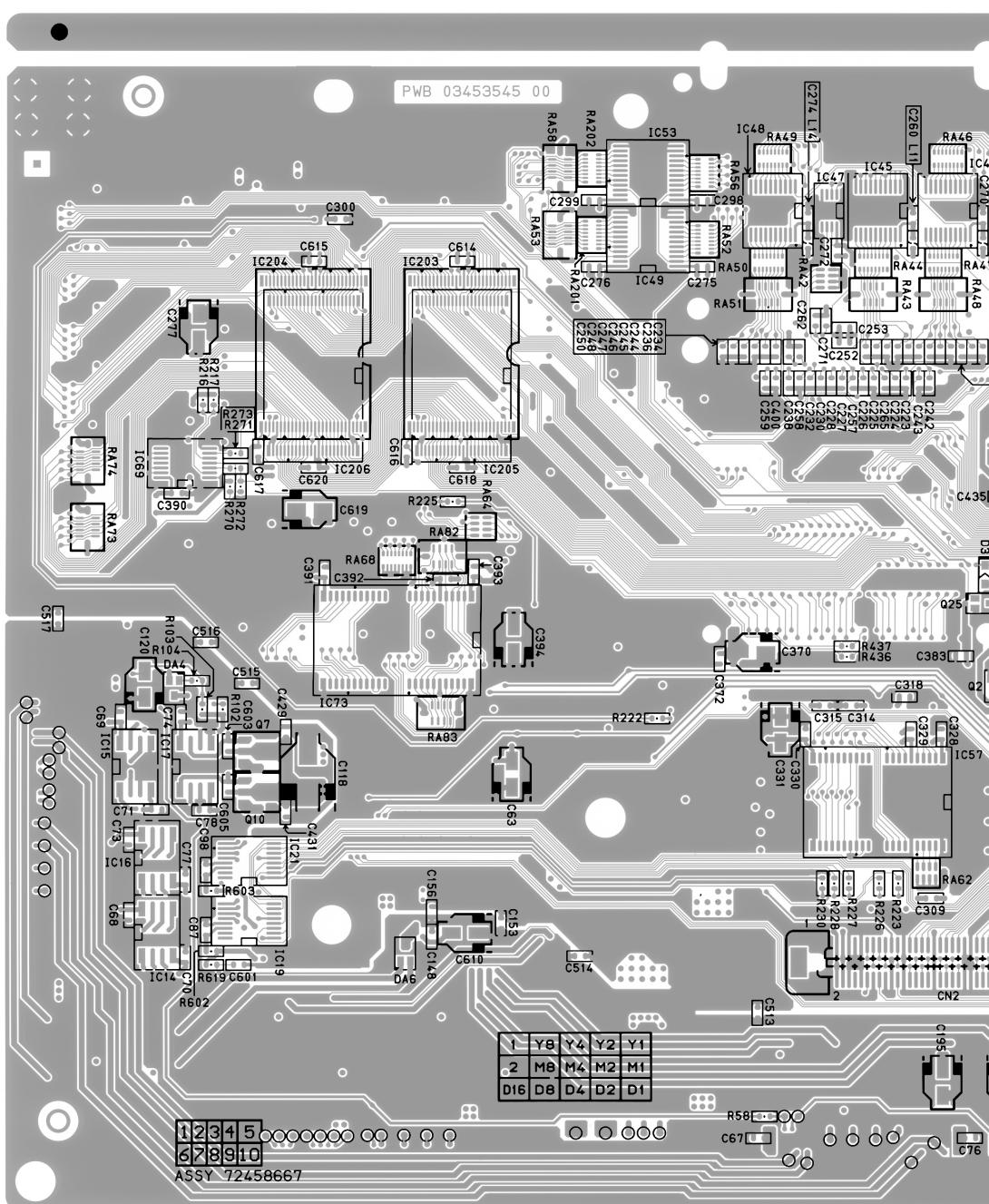


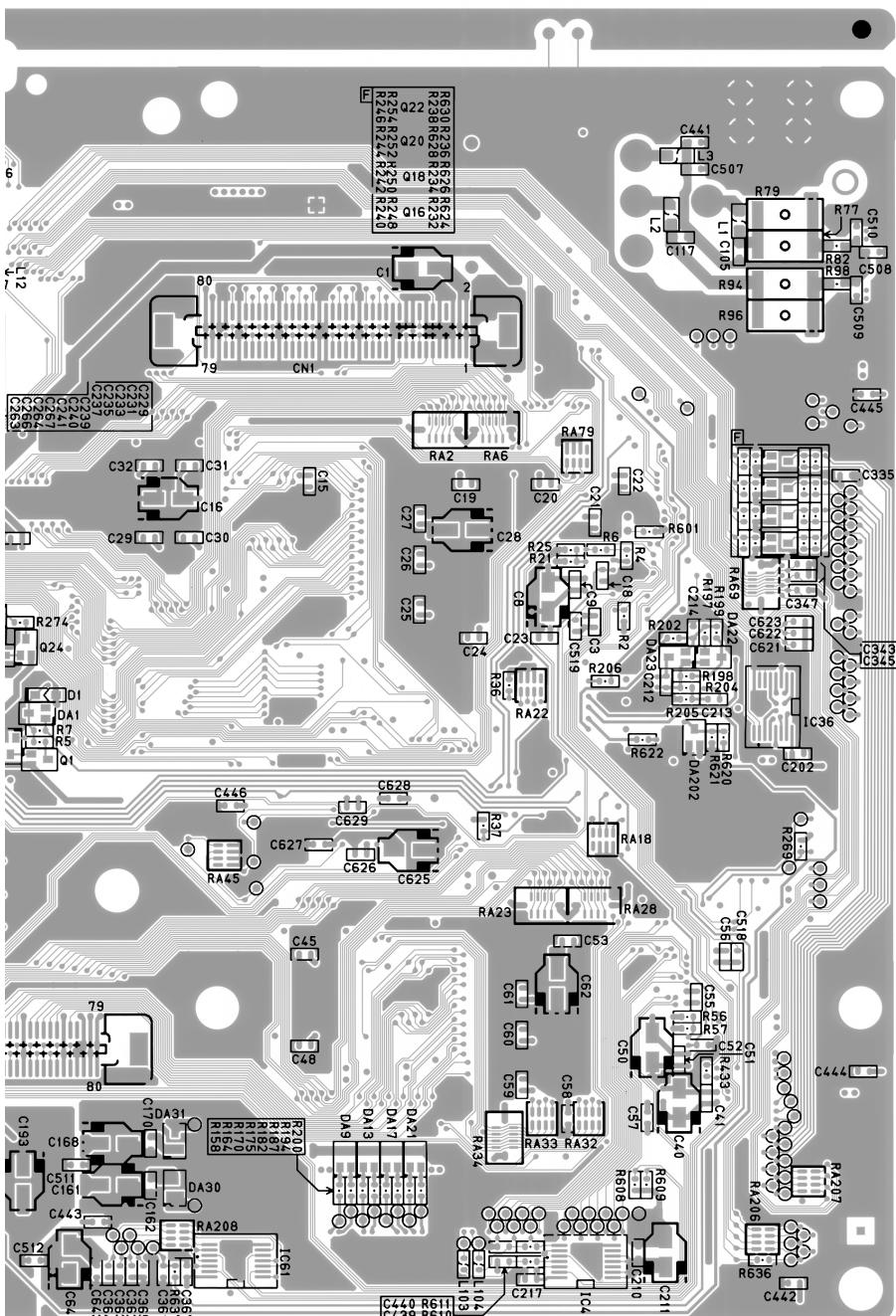
CIRCUIT BOARD (MAIN)



View from components side

CIRCUIT BOARD (MAIN)

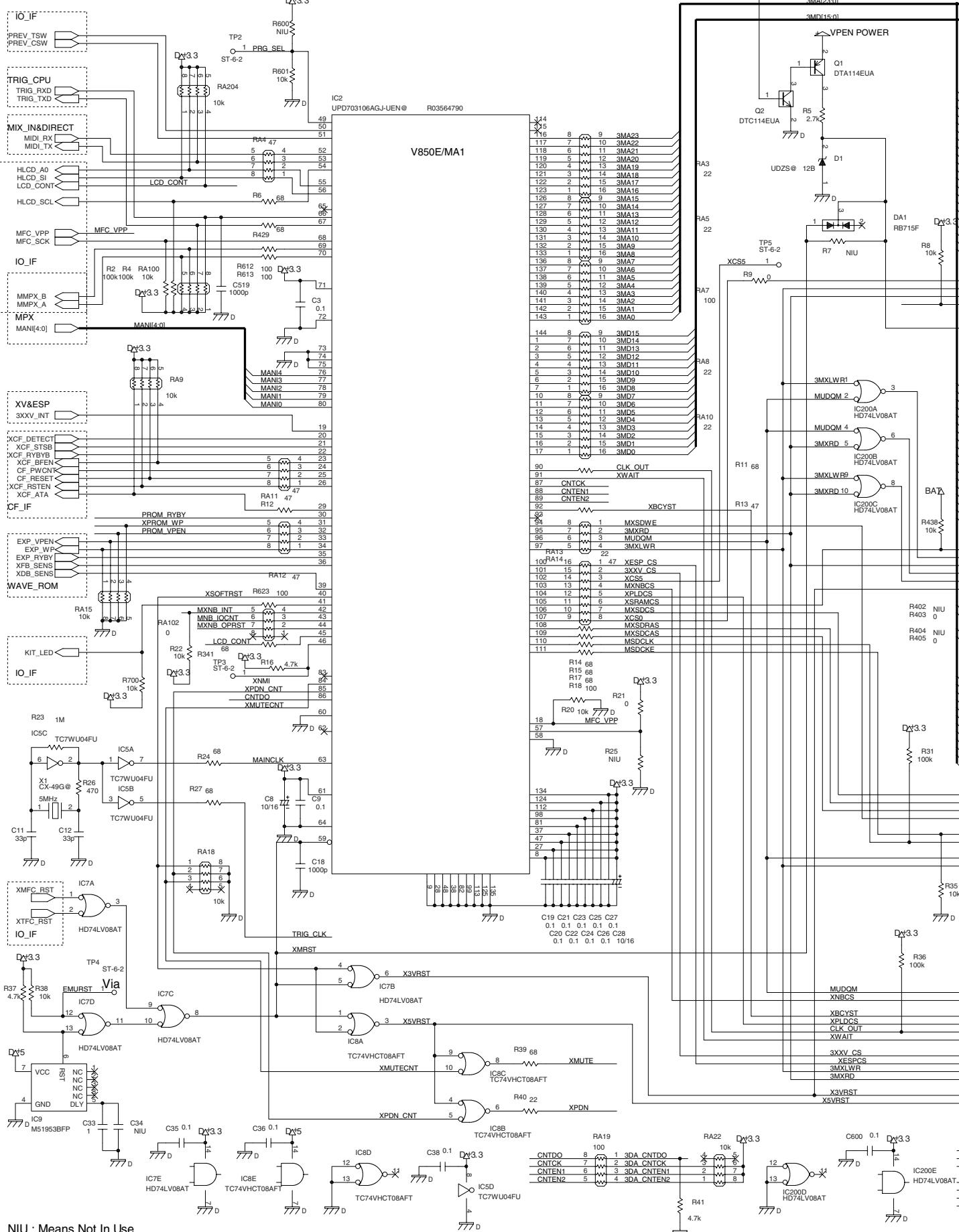




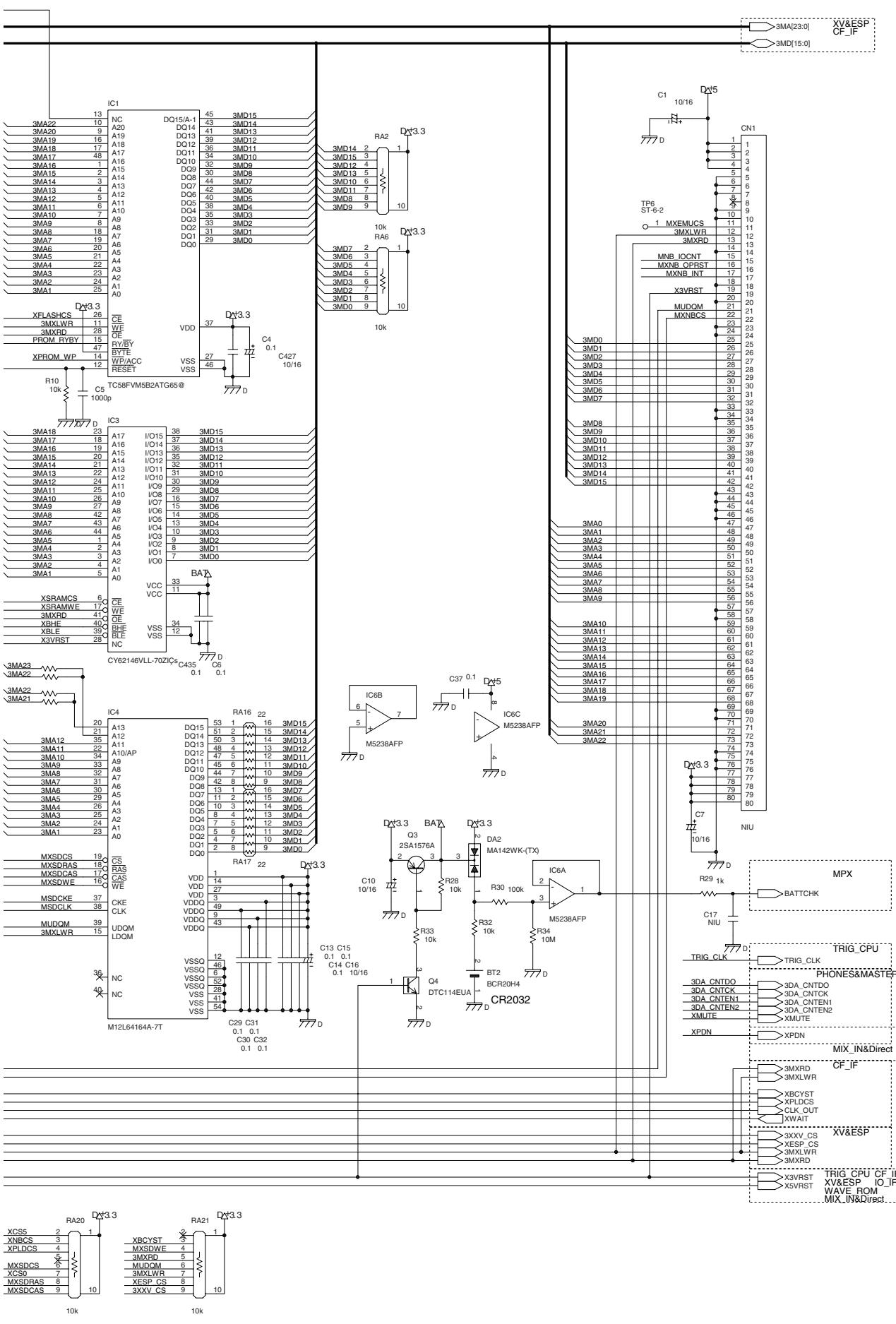
View from foil side

CIRCUIT DIAGRAM (MAIN 1/9)

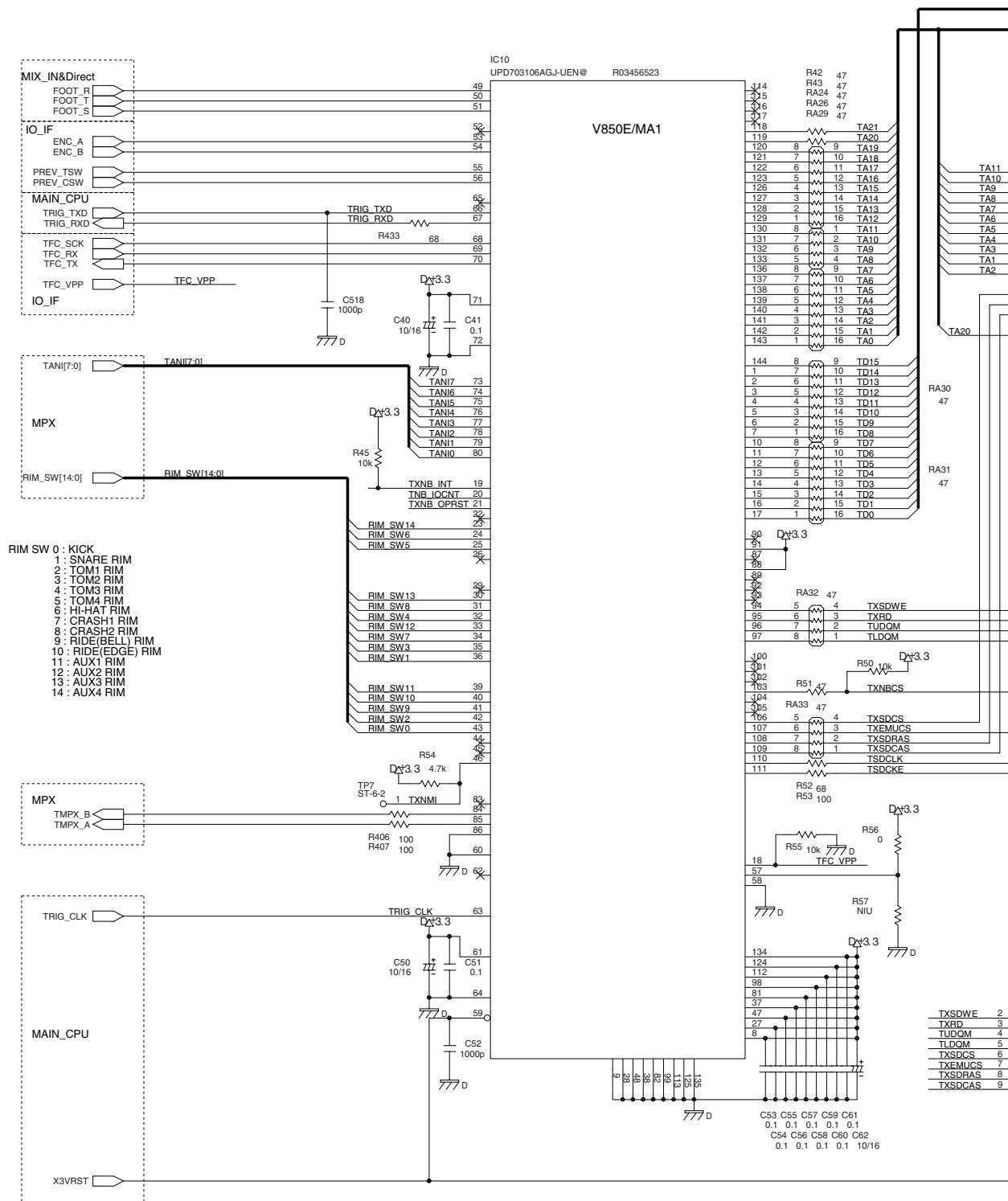
MAIN BOARD (MAIN_CPU)



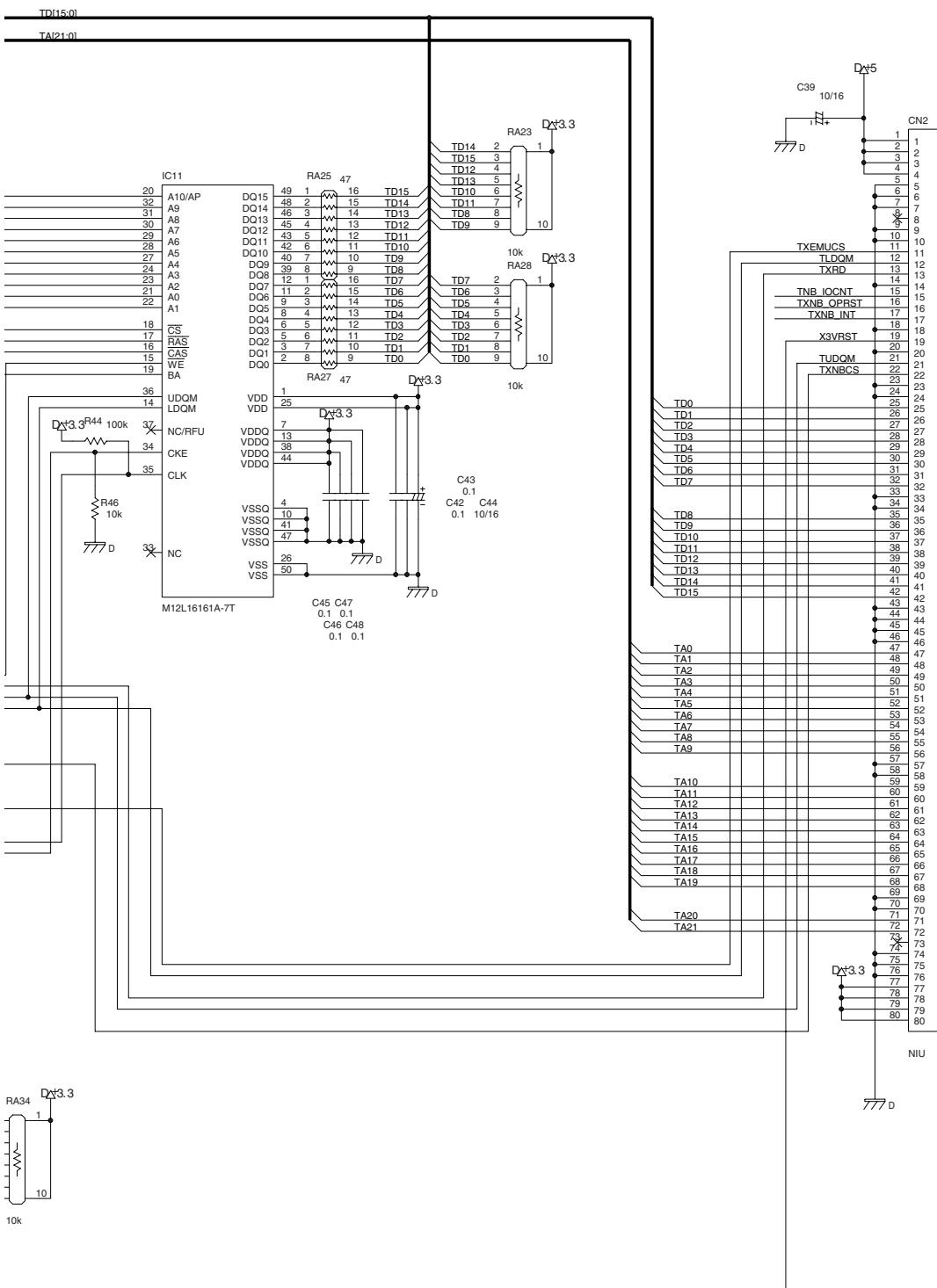
NIU : Means Not In Use



CIRCUIT DIAGRAM (MAIN 2/9)

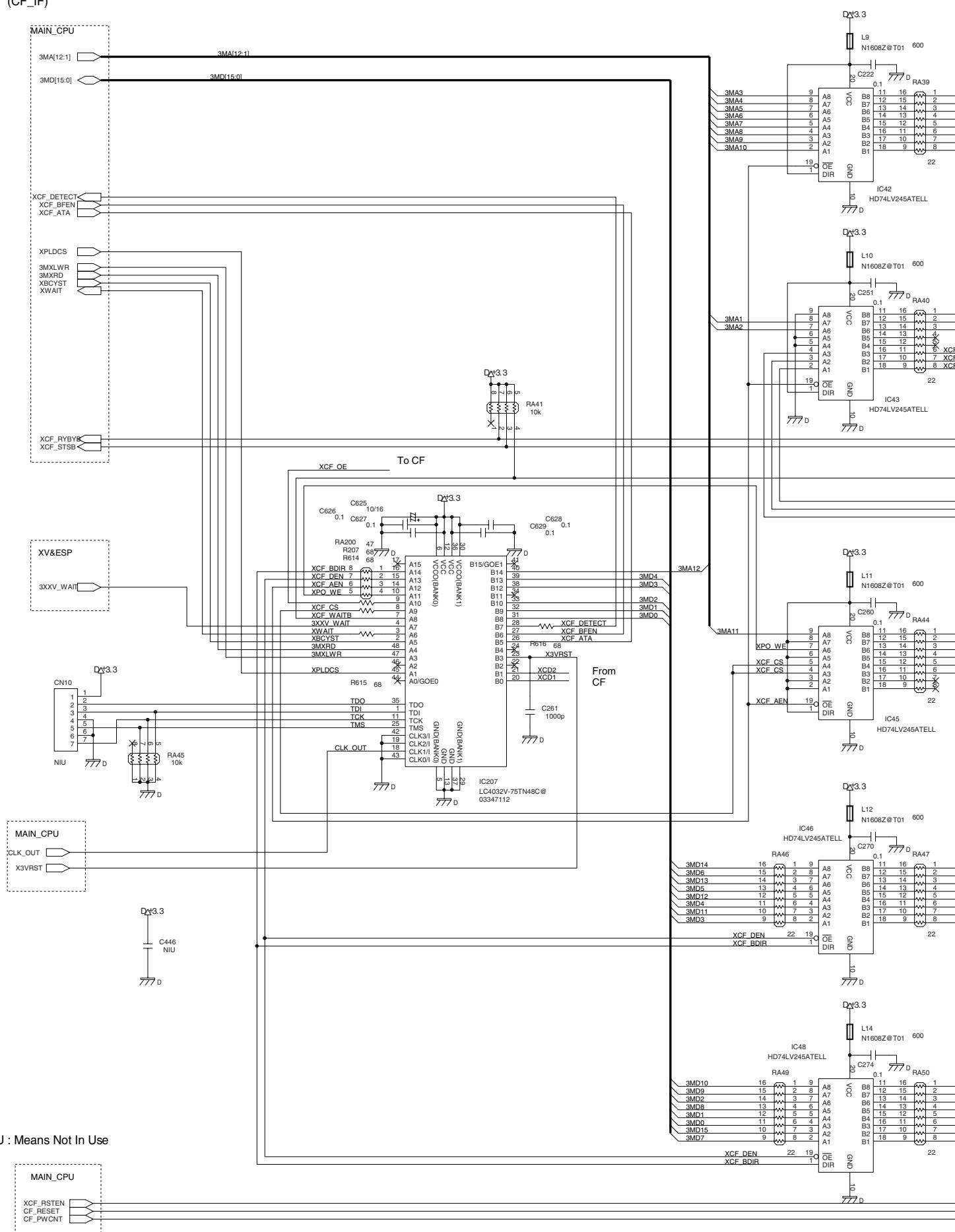
MAIN BOARD
(TRIG_CPU)

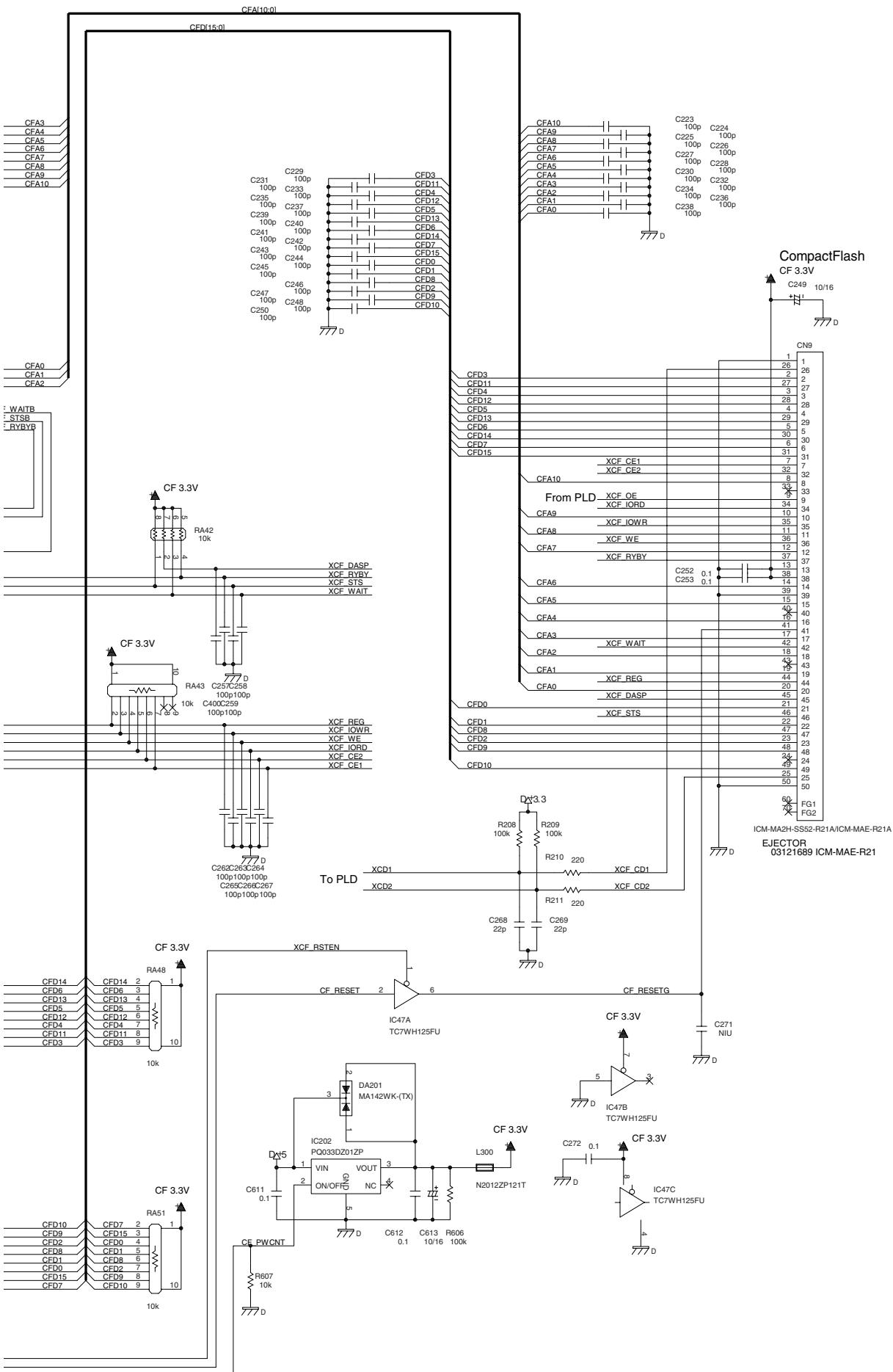
NIU : Means Not In Use



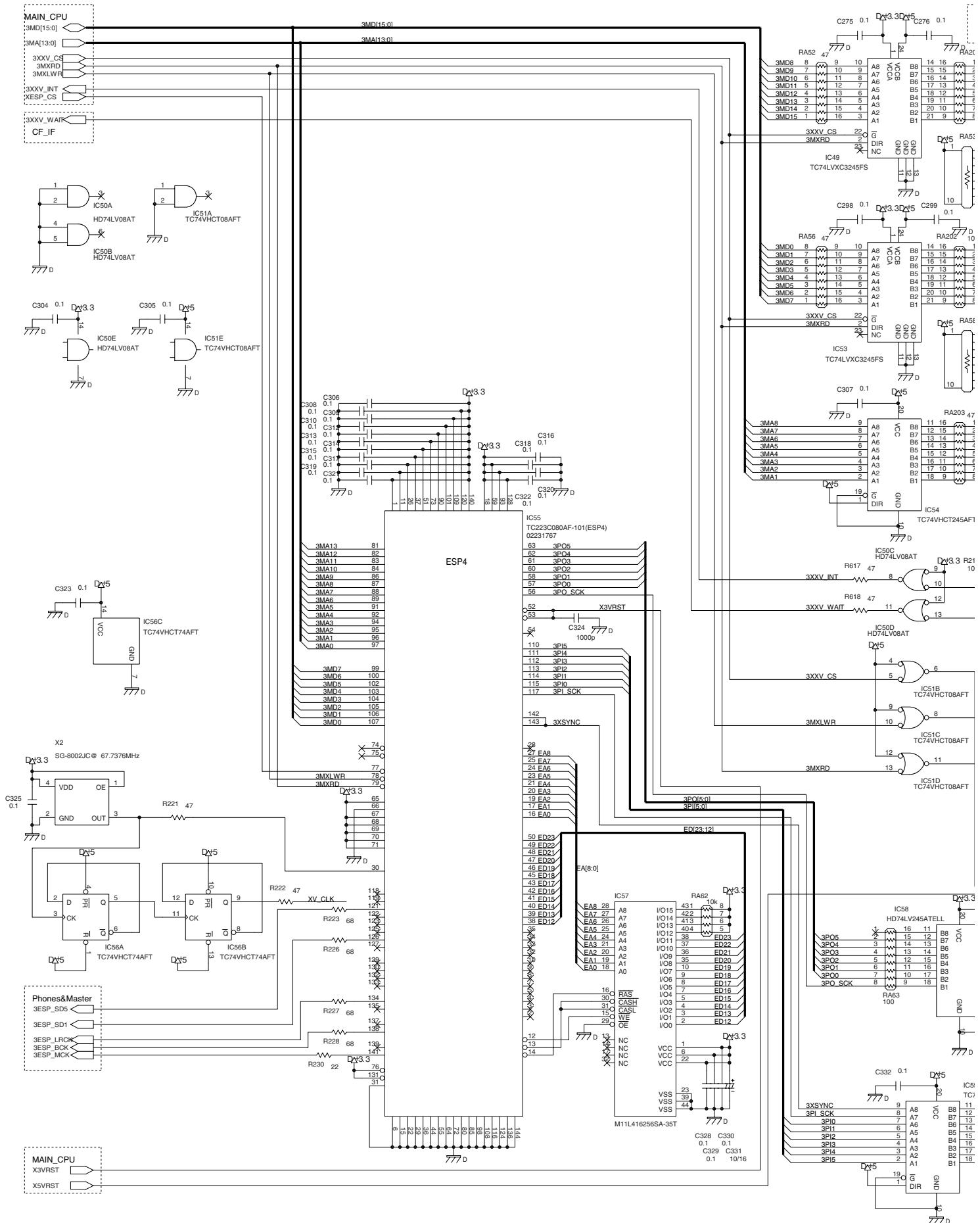
CIRCUIT DIAGRAM (MAIN 3/9)

MAIN BOARD
(CF_IF)

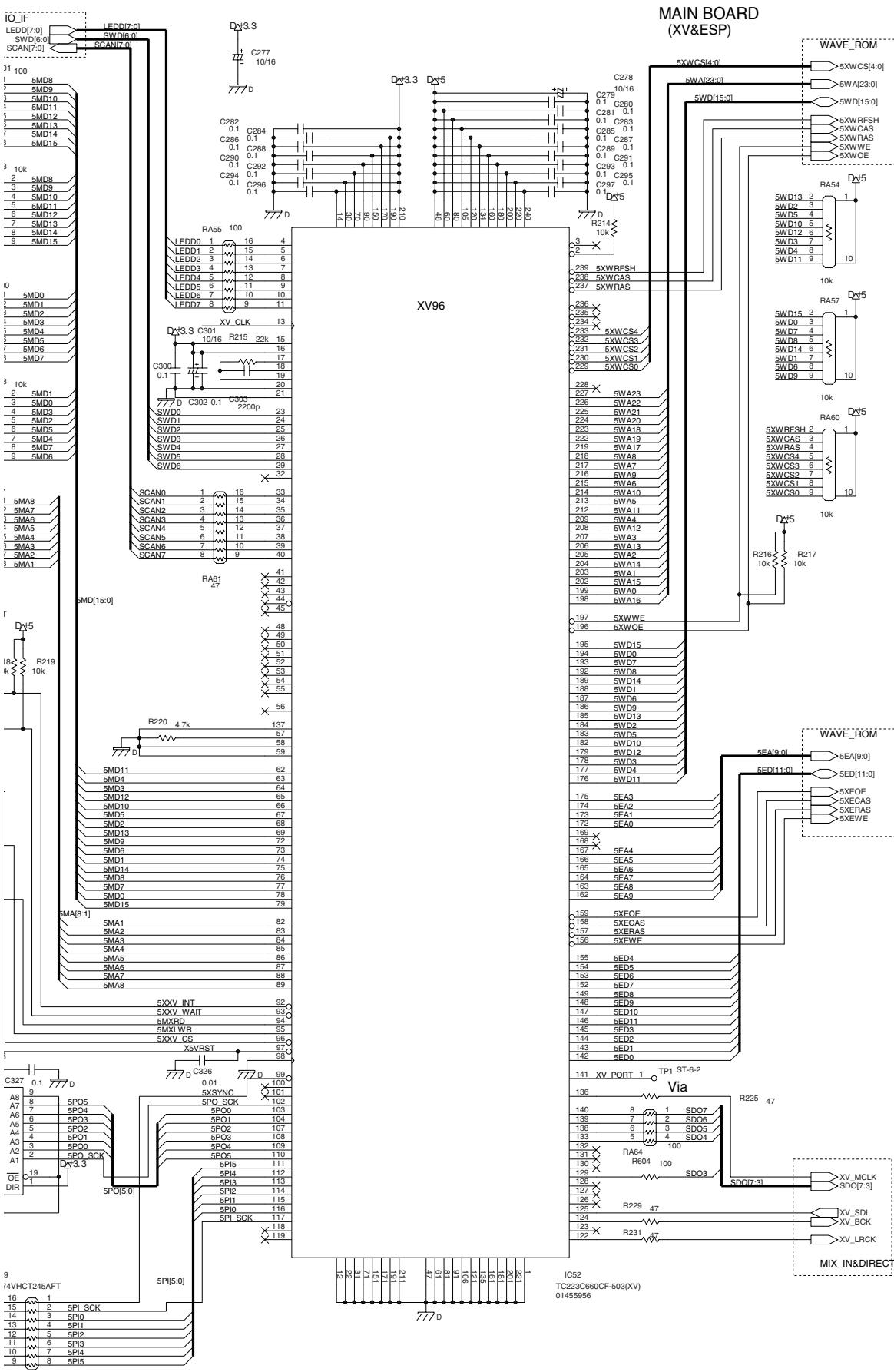




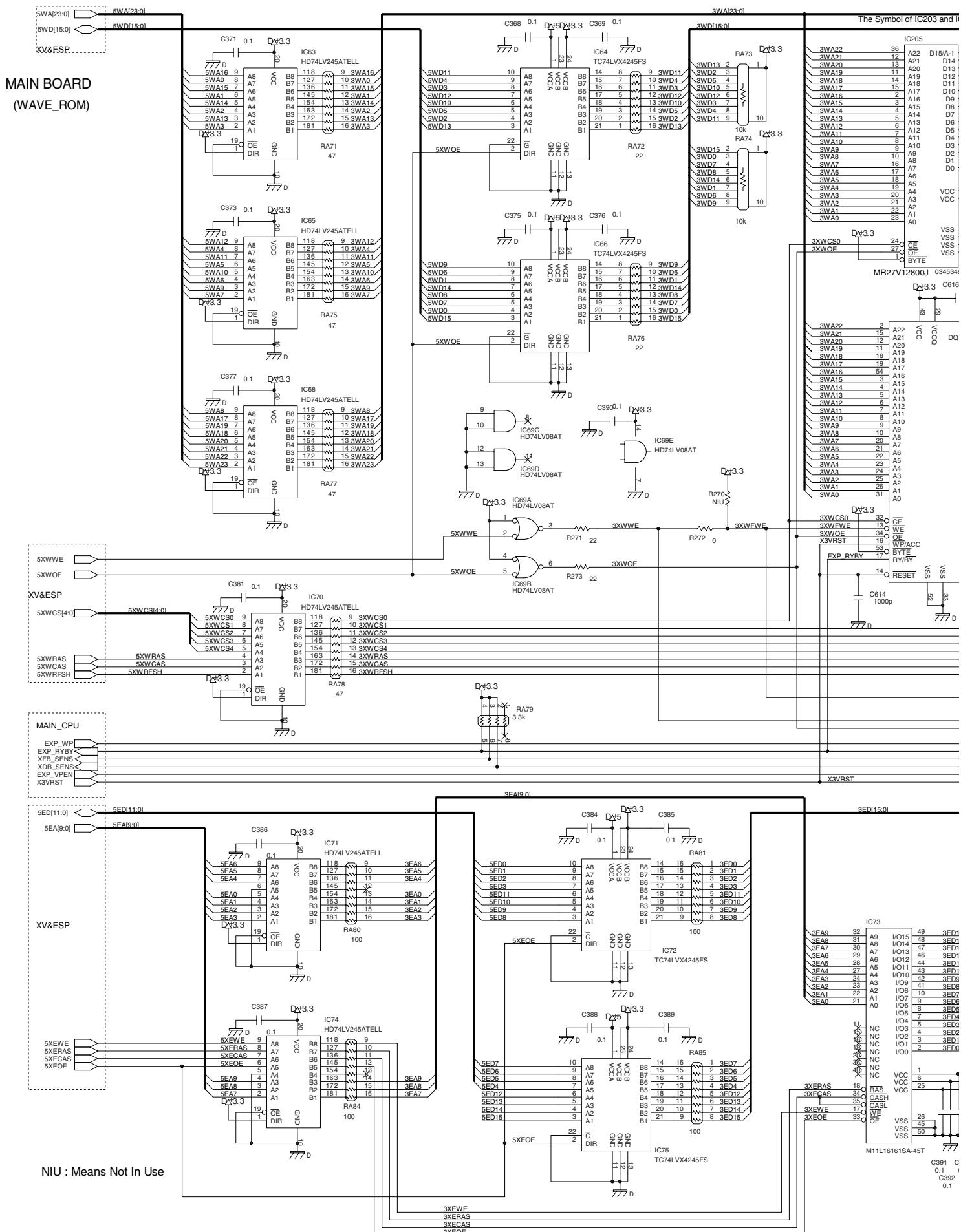
CIRCUIT DIAGRAM (MAIN 4/9)



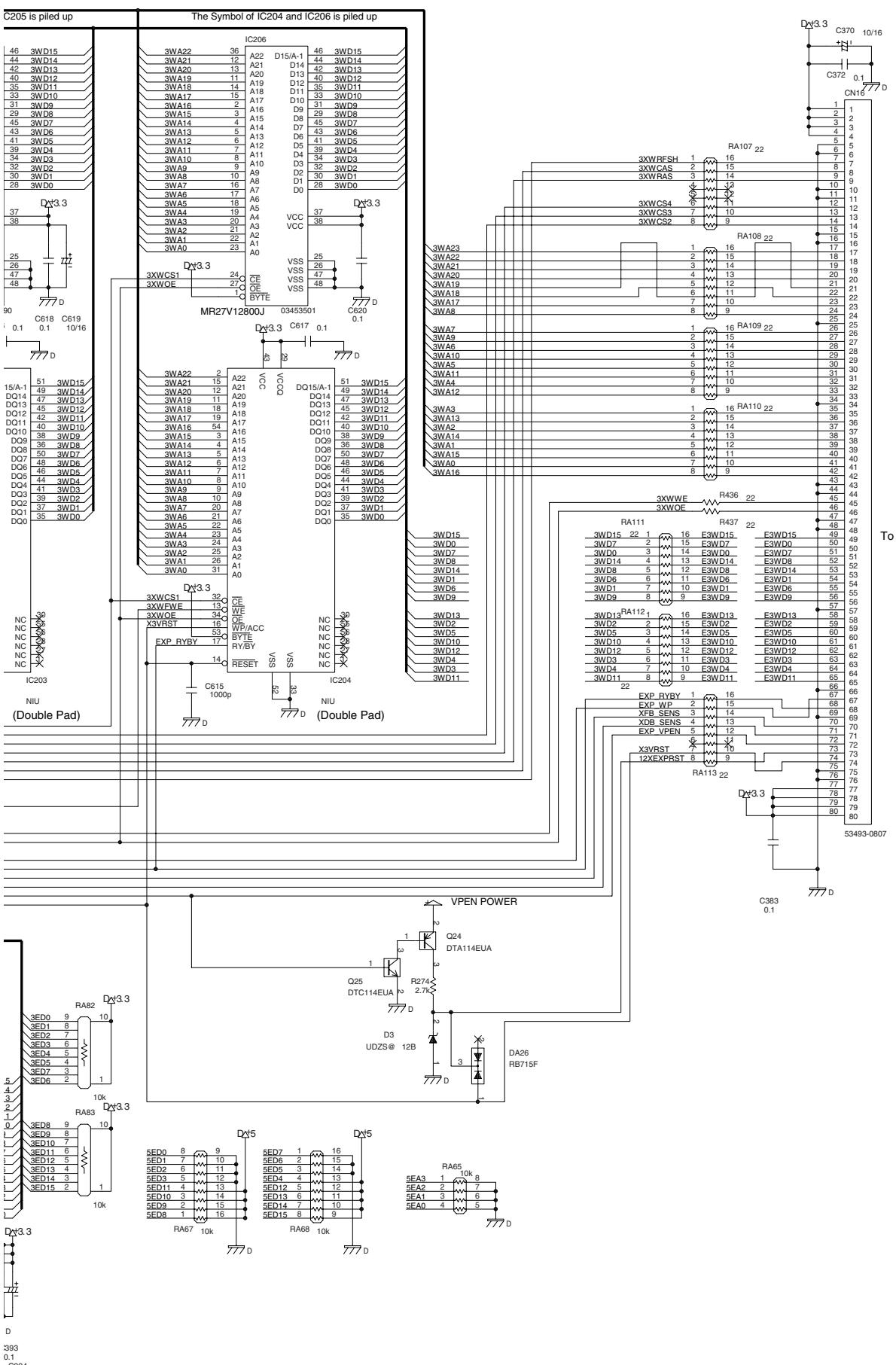
NIU : Means Not In Use



CIRCUIT DIAGRAM (MAIN 5/9)

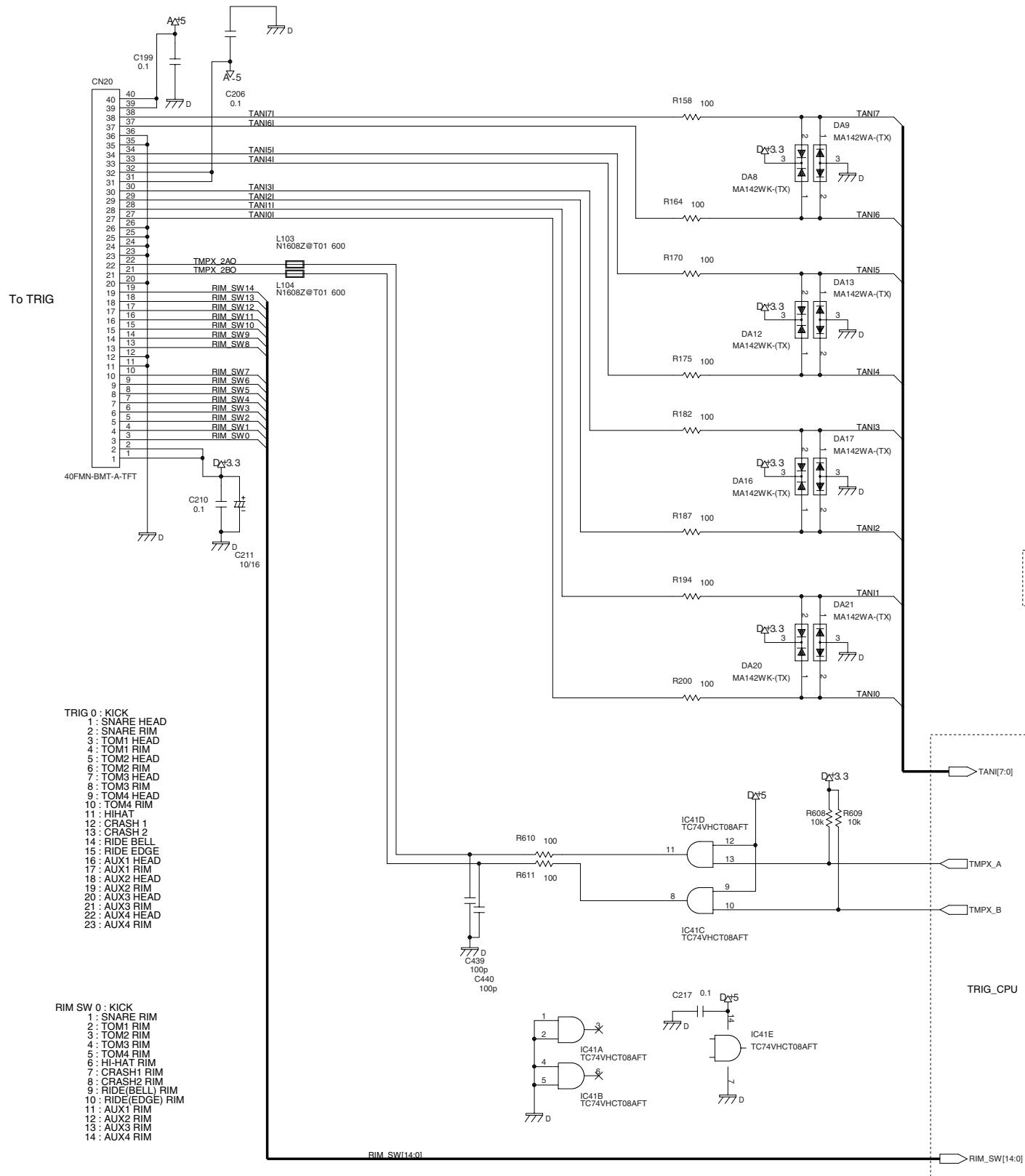


NILL : Means Not In Use

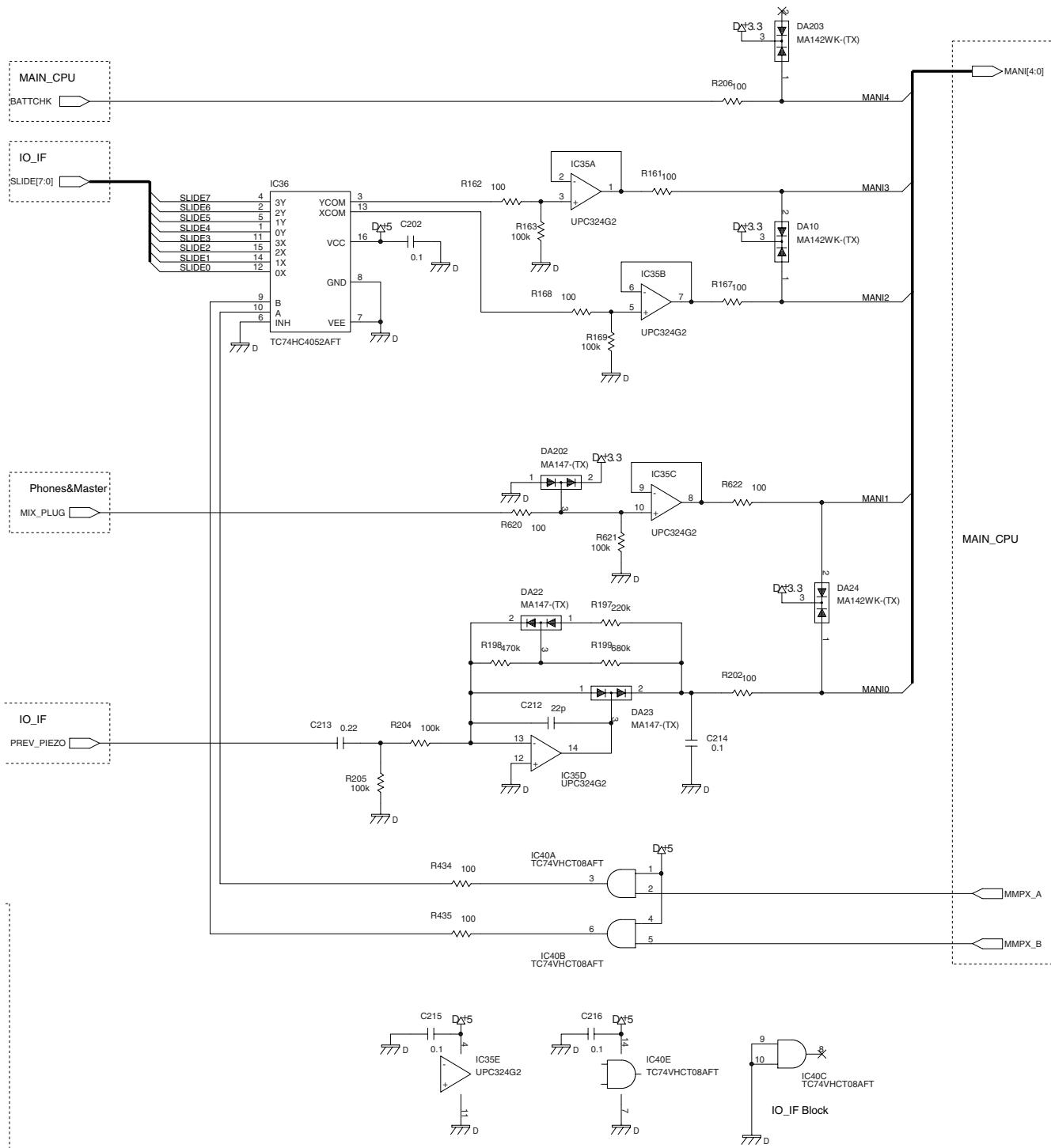


CIRCUIT DIAGRAM (MAIN 6/9)

MAIN BOARD
(MPX)

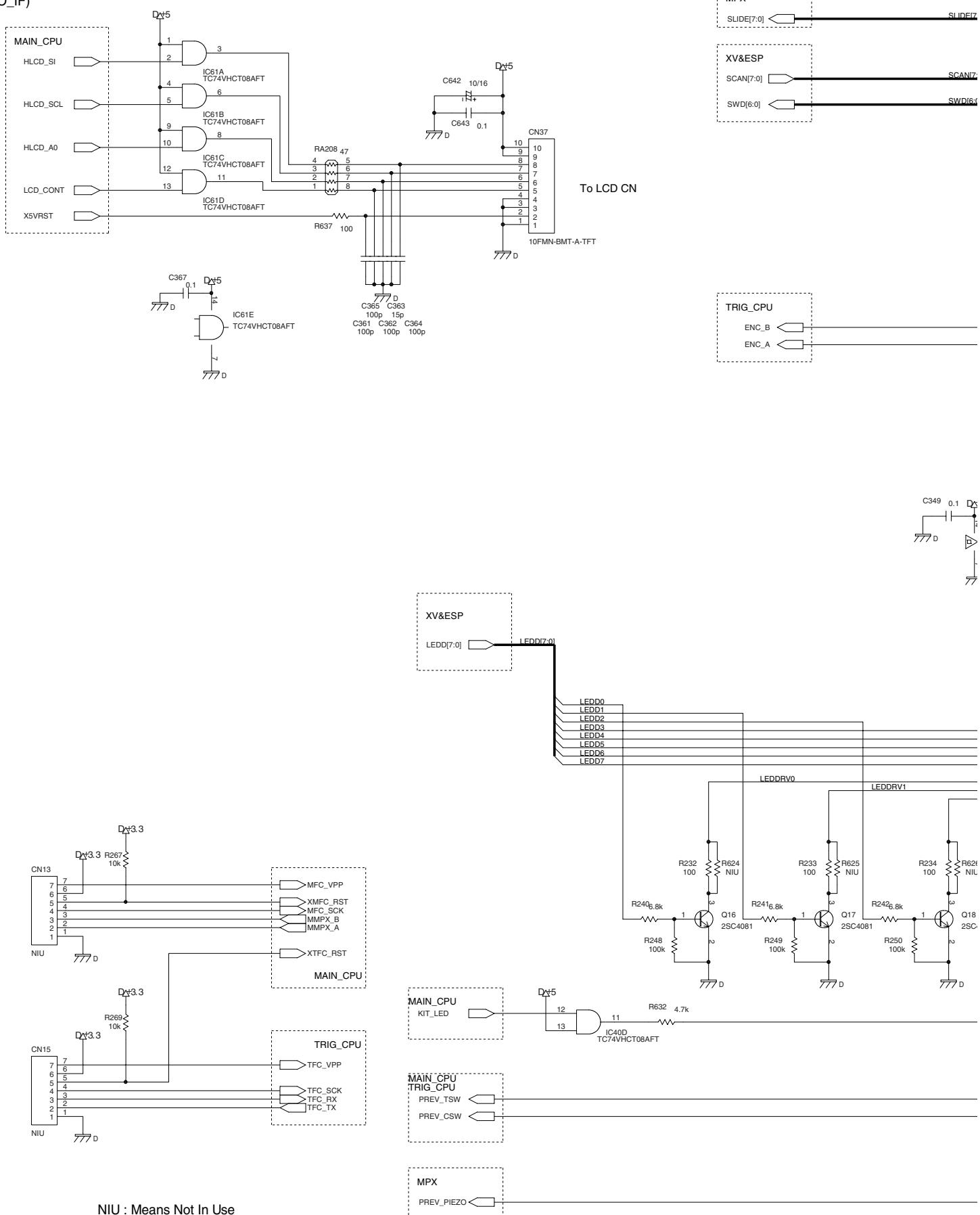


NIU : Means Not In Use

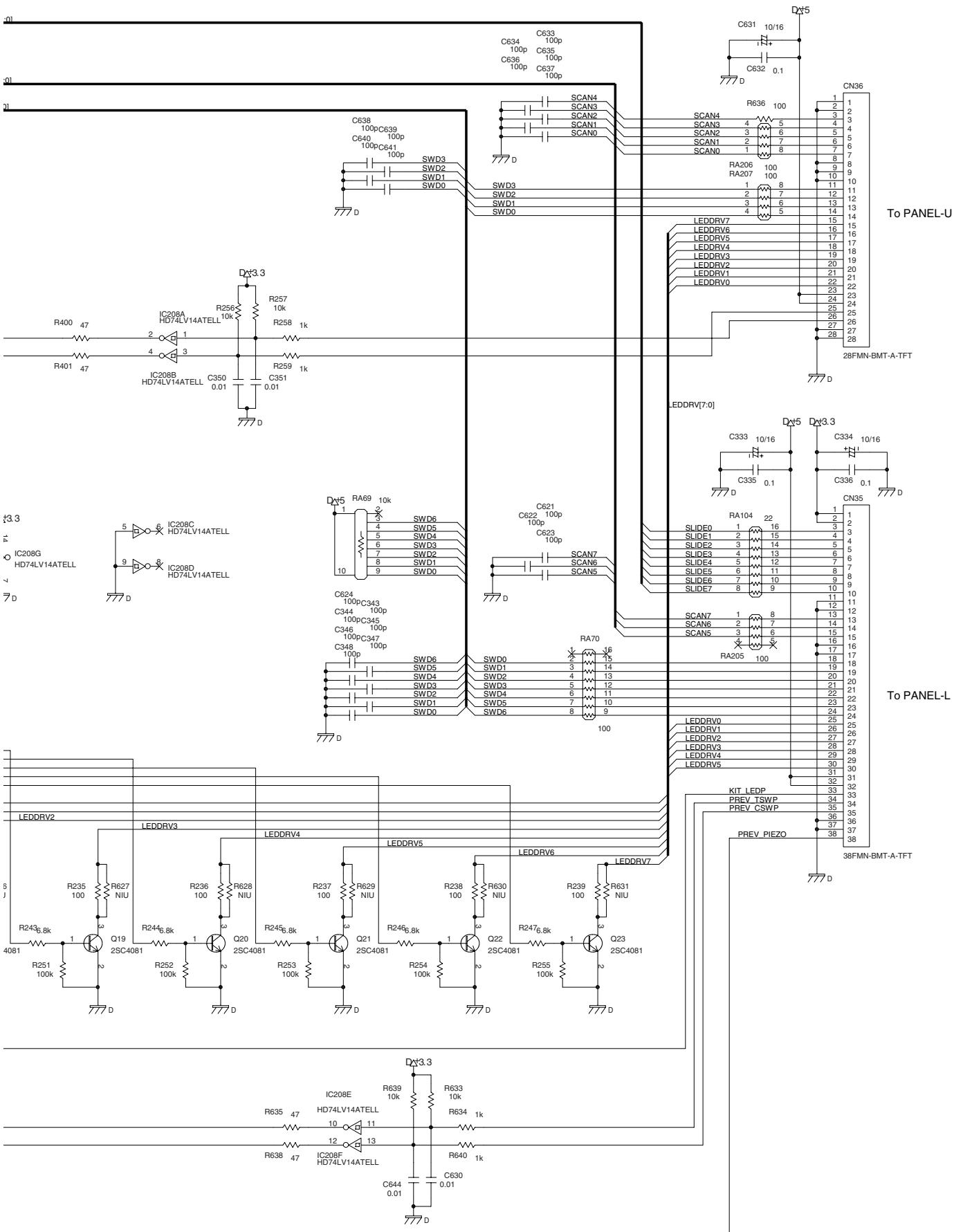


CIRCUIT DIAGRAM (MAIN 7/9)

MAIN BOARD
(IO_IF)

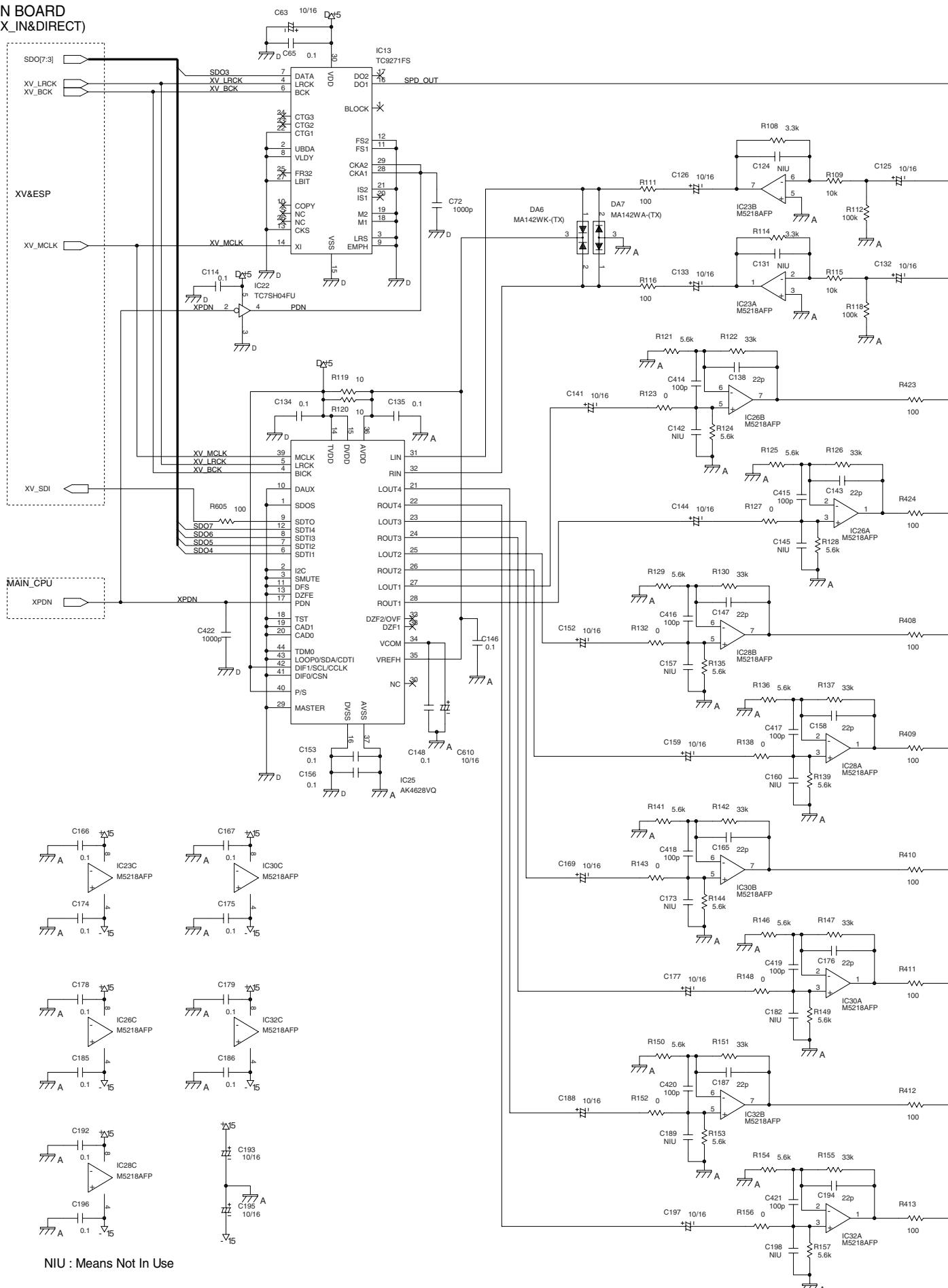


NIU : Means Not In Use

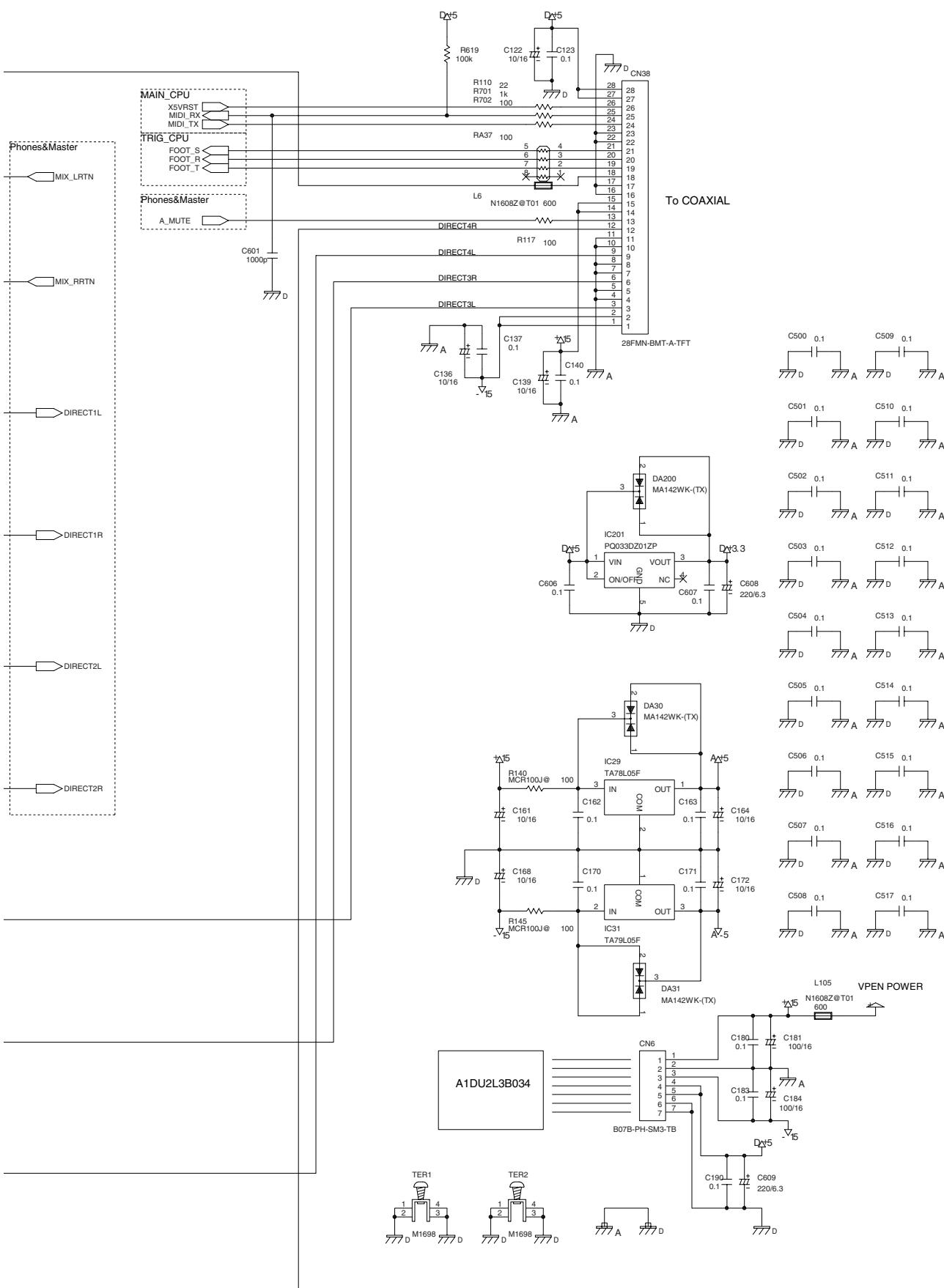


CIRCUIT DIAGRAM (MAIN 8/9)

MAIN BOARD (MIX_IN&DIRECT)

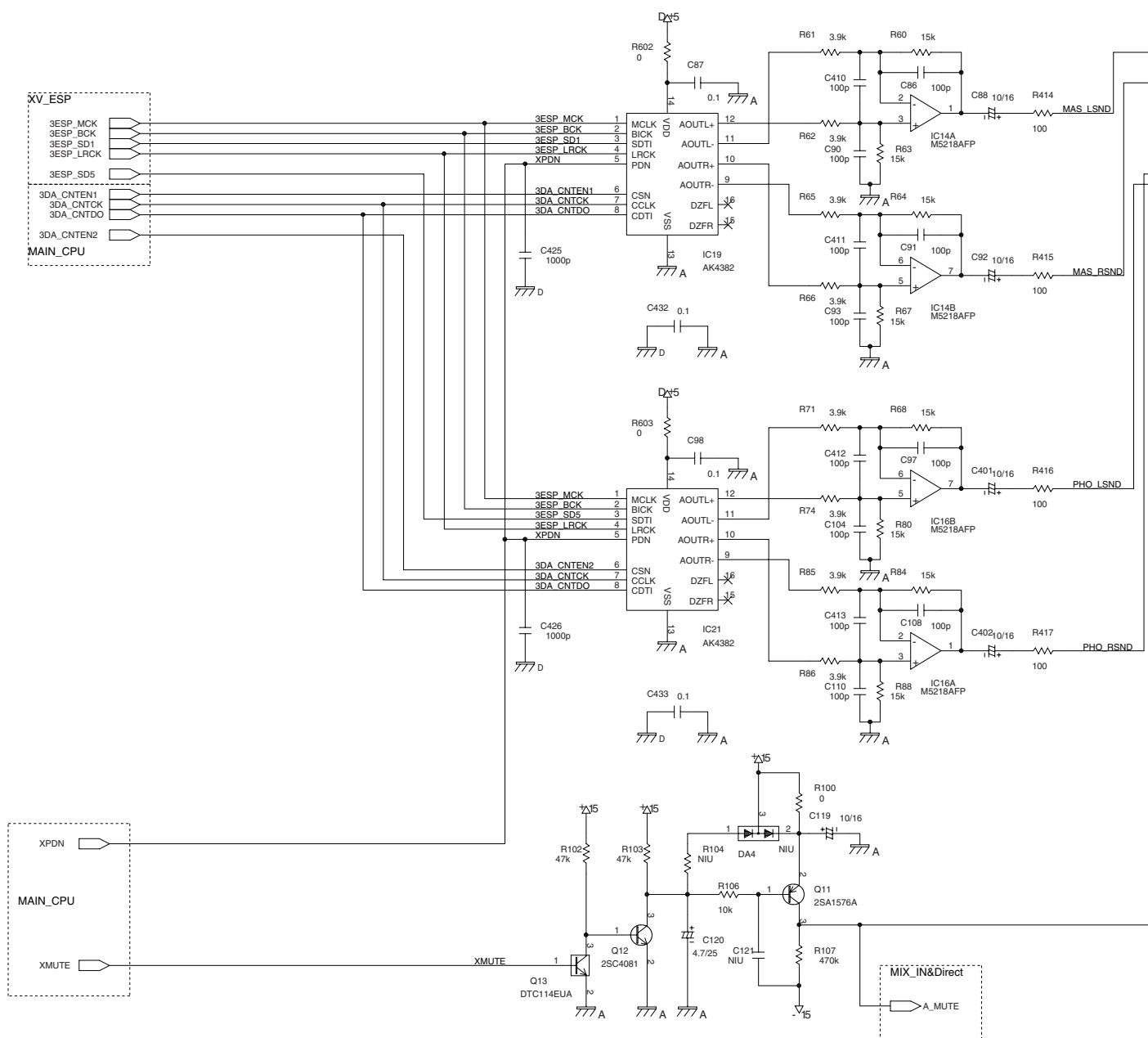


NIU : Means Not In Use

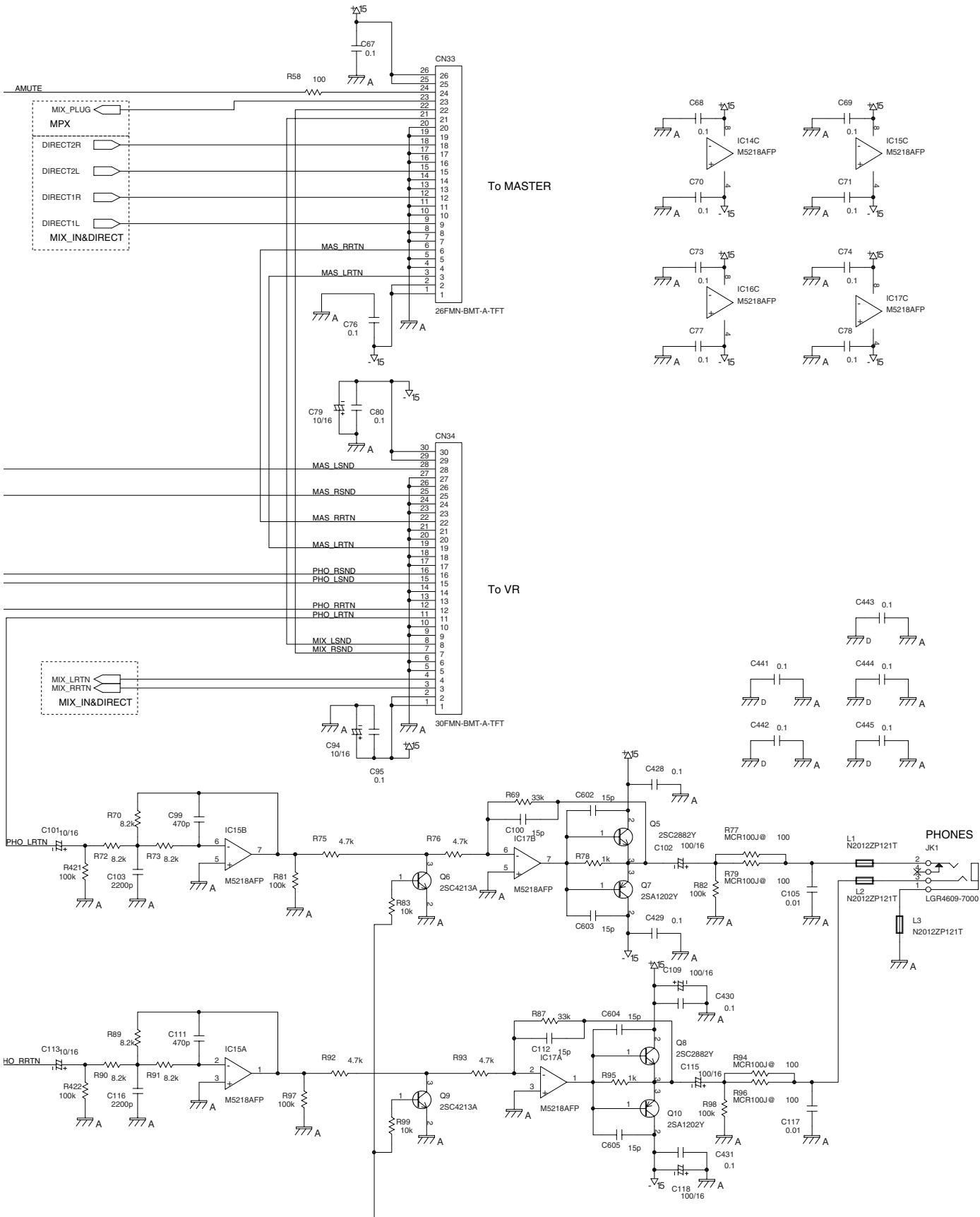


CIRCUIT DIAGRAM (MAIN 9/9)

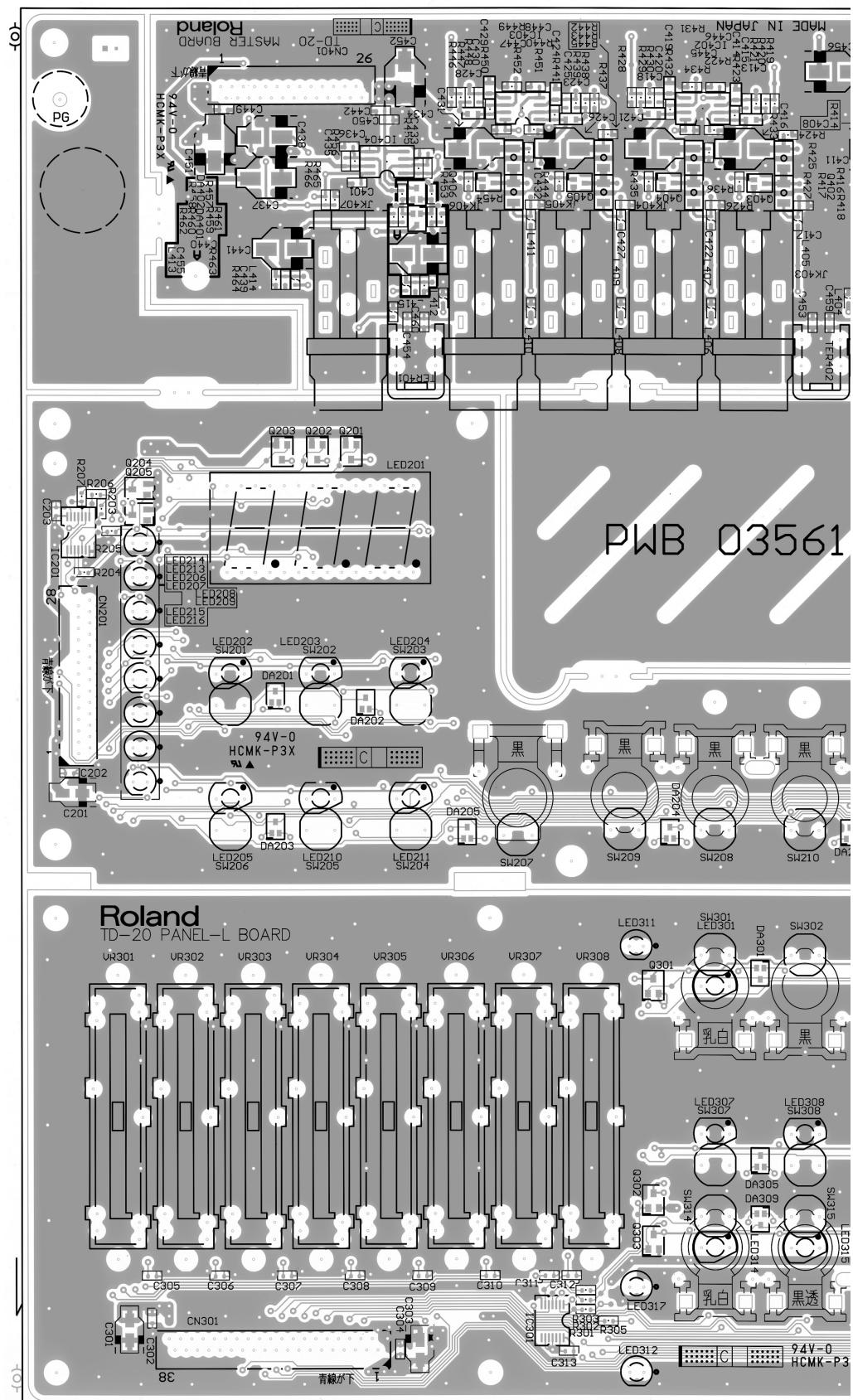
MAIN BOARD
(PHONES&MASTER)

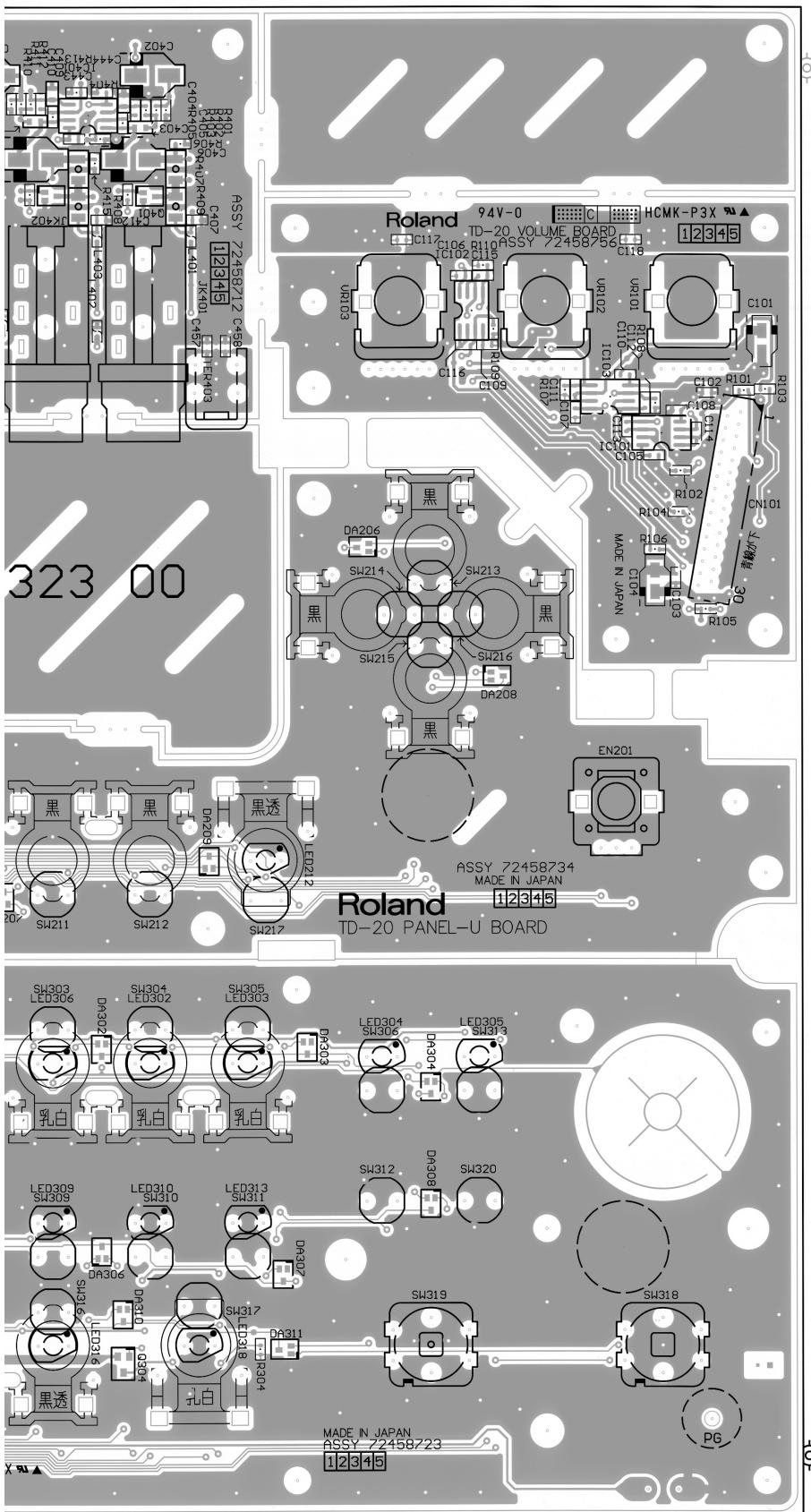


NIU : Means Not In Use



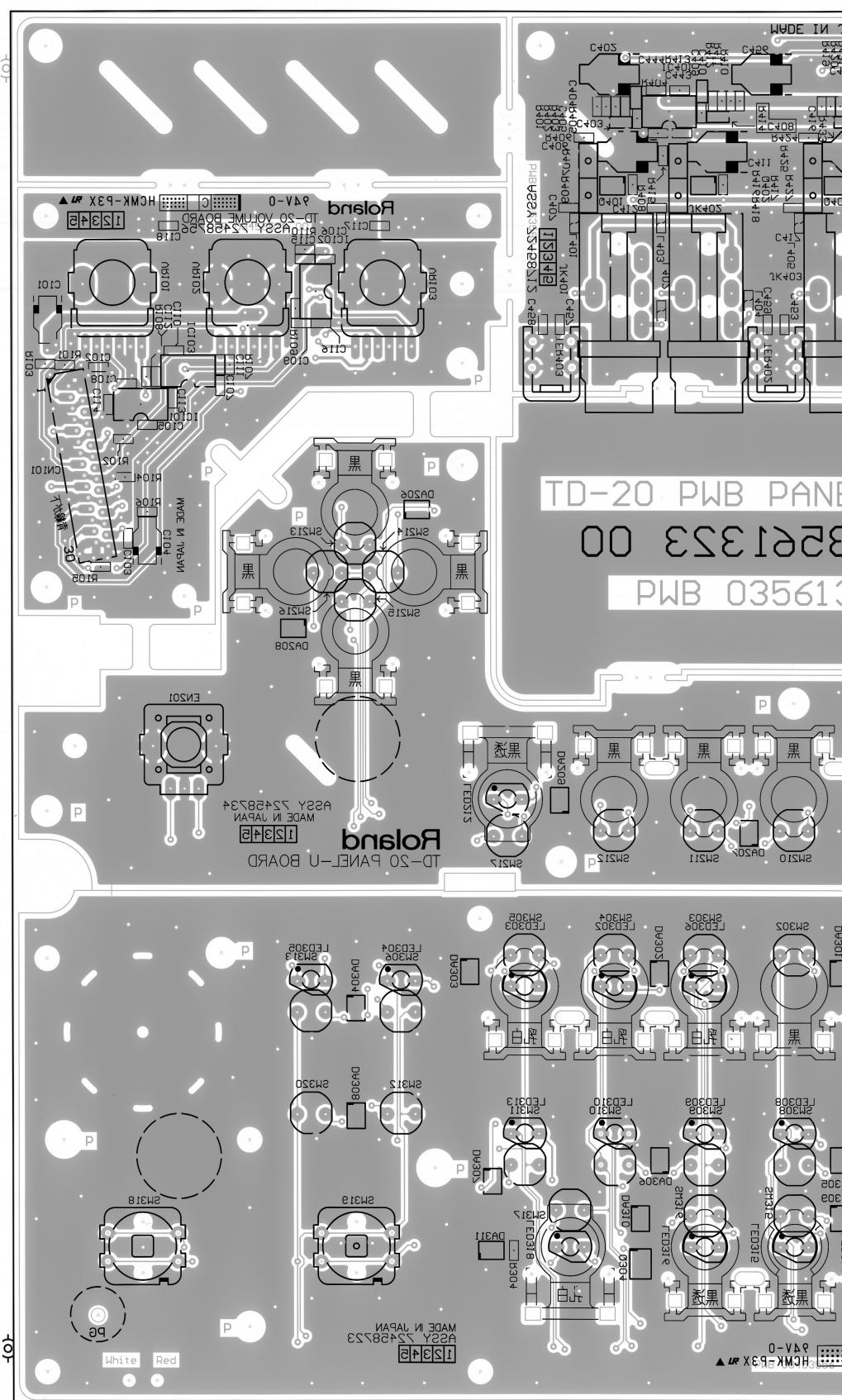
CIRCUIT BOARD (PANEL-U&L/MASTER/VOLUME)

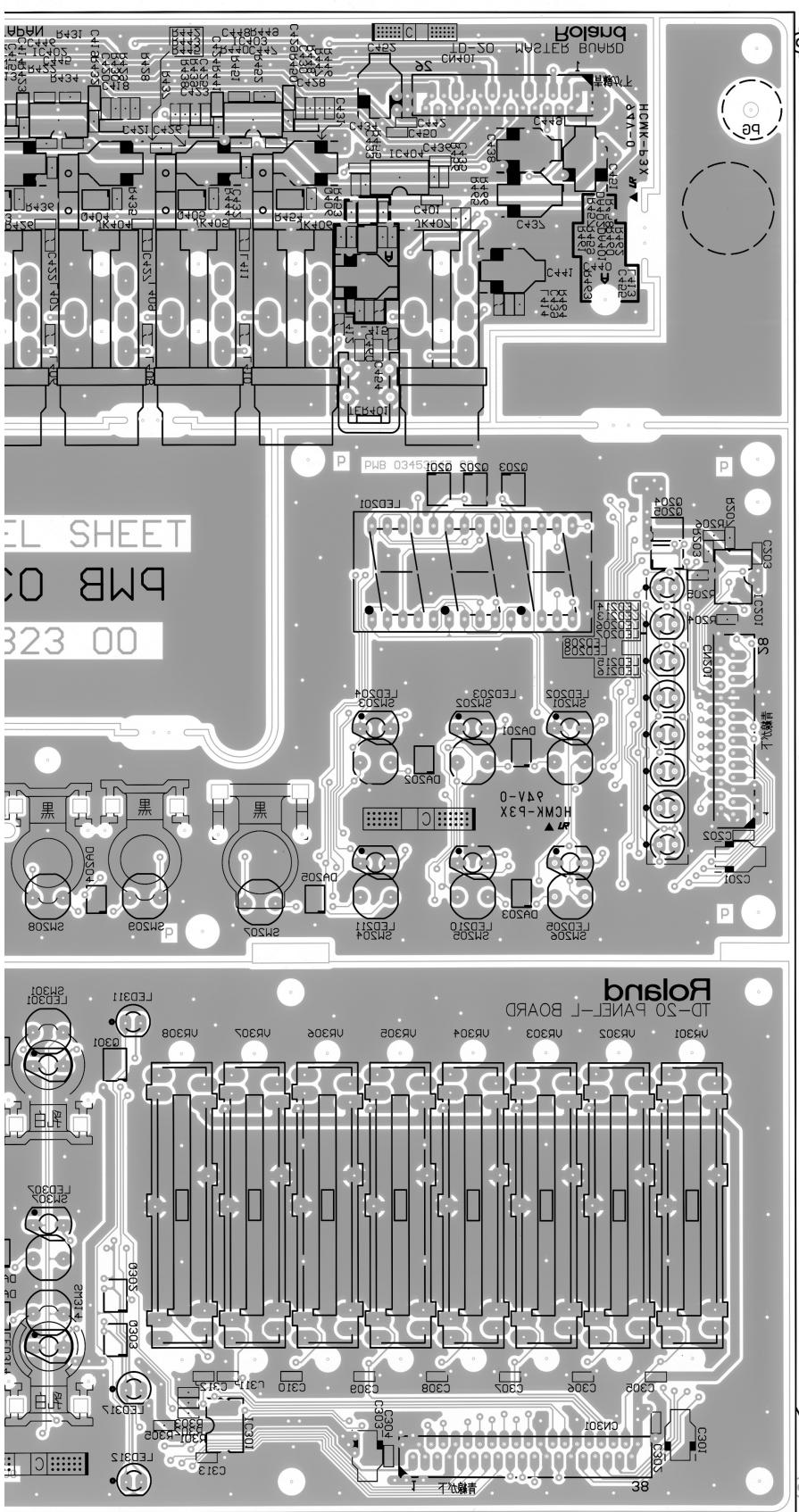




View from components side

CIRCUIT BOARD (PANEL-U&L/MASTER/VOLUME)

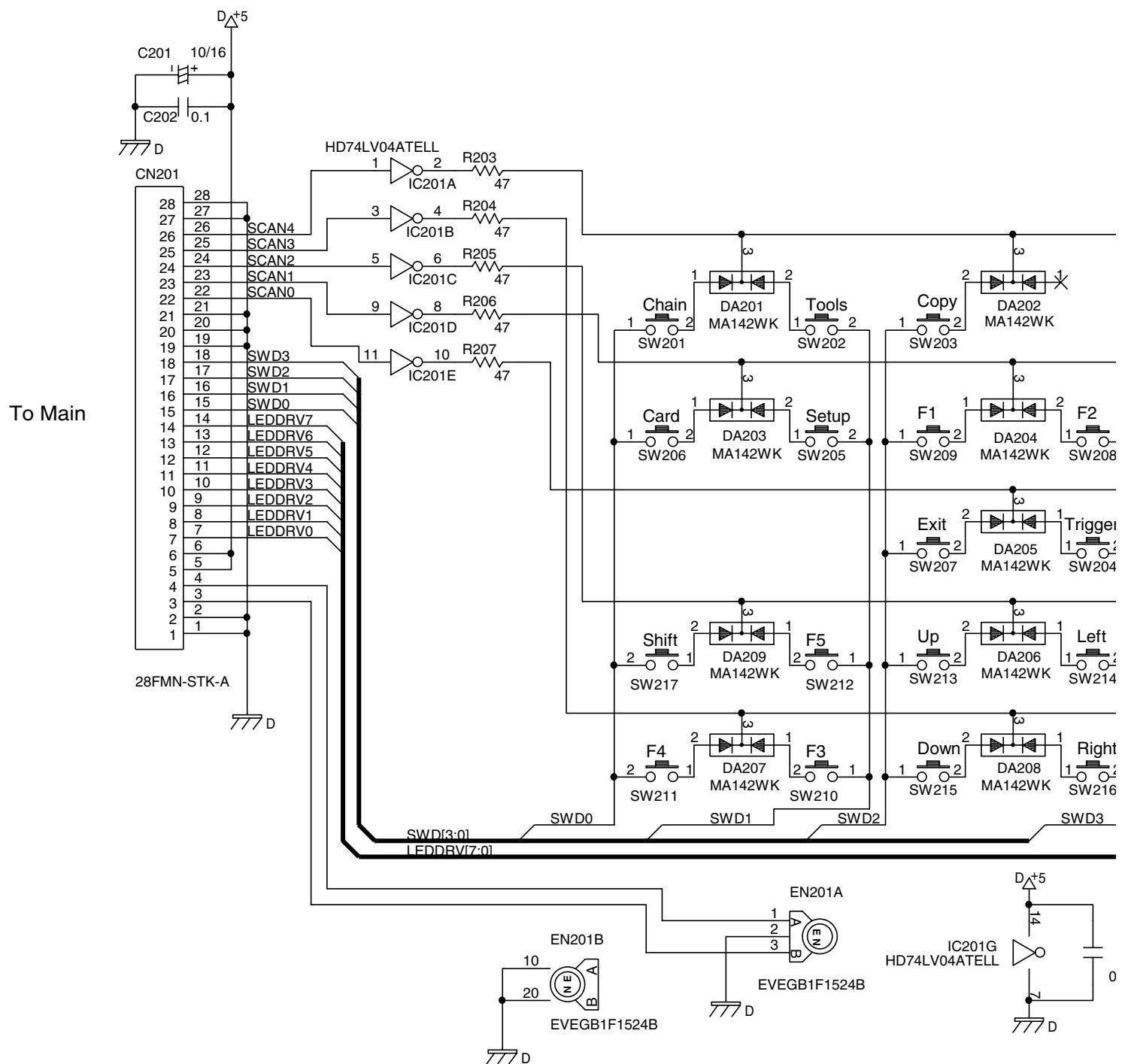


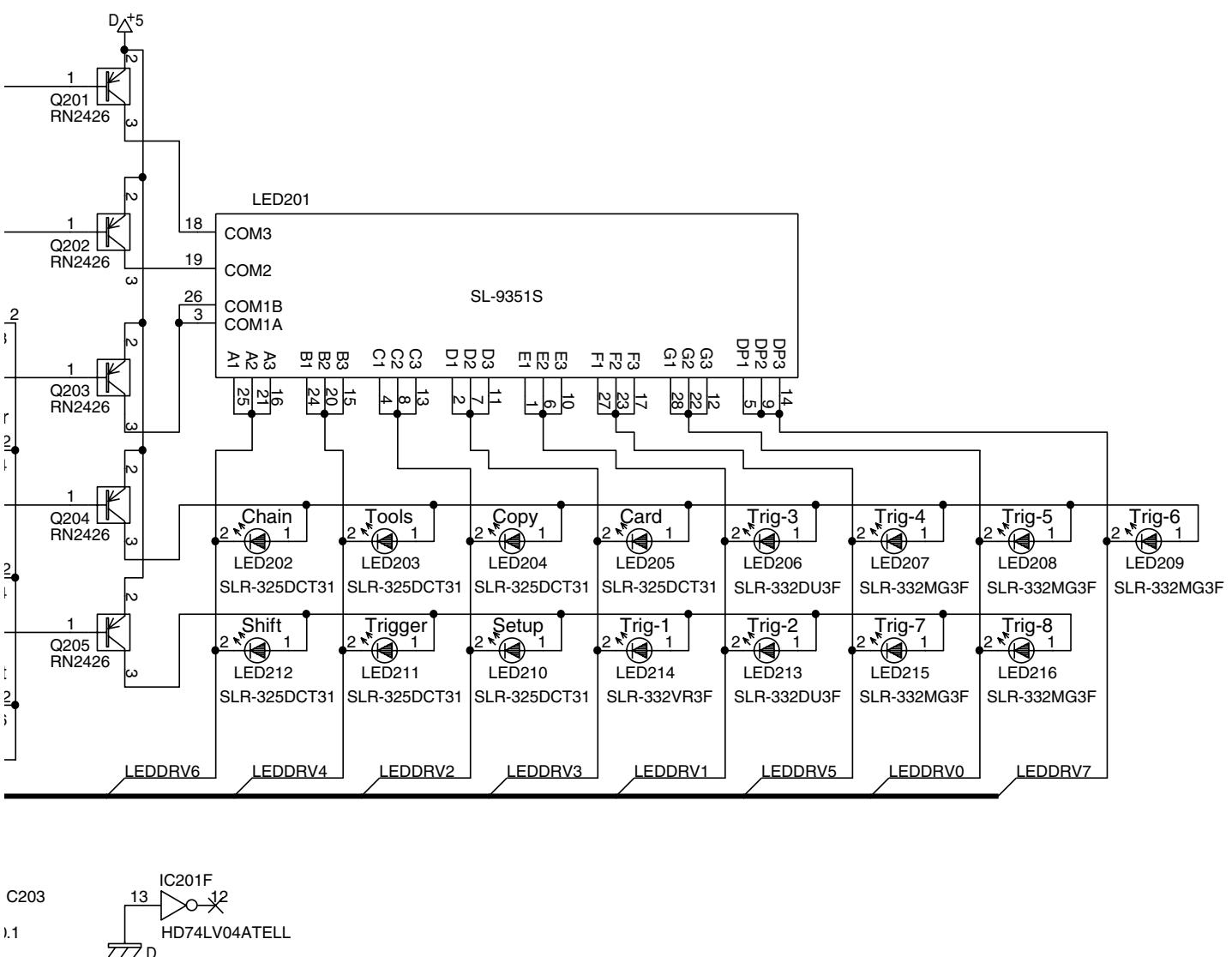


View from foil side

CIRCUIT DIAGRAM (PANEL-U)

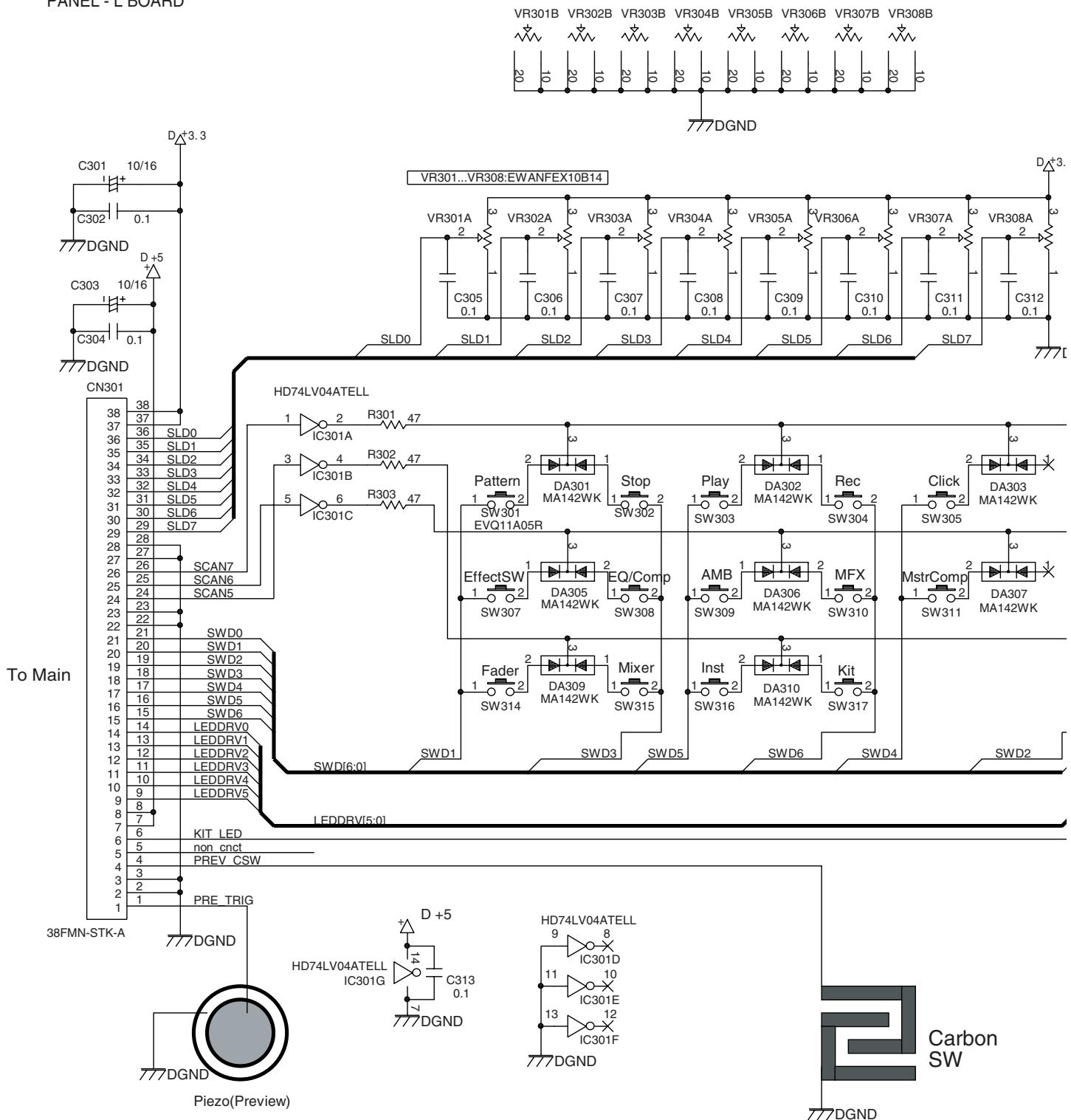
PANEL - U BOARD

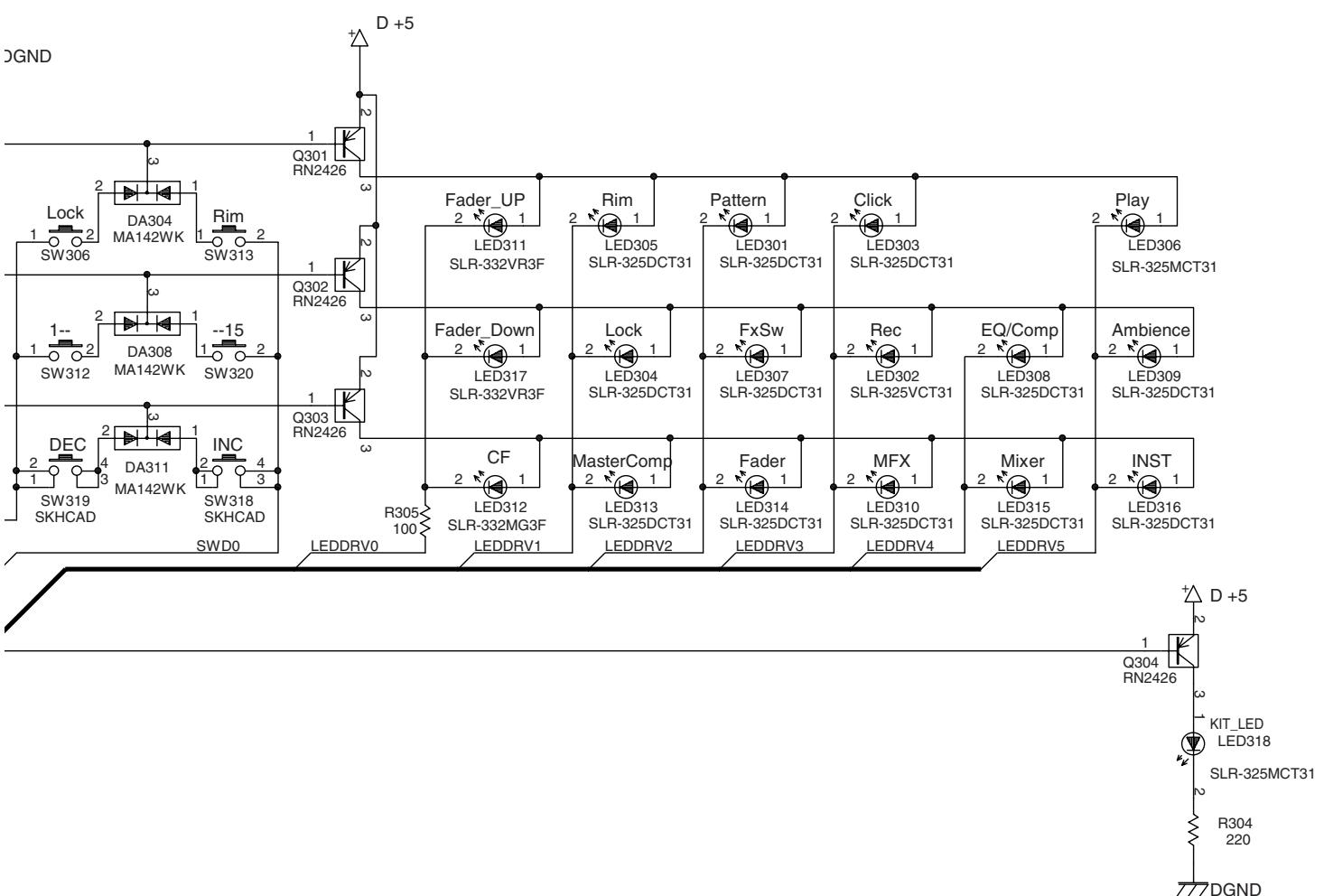




CIRCUIT DIAGRAM (PANEL-L)

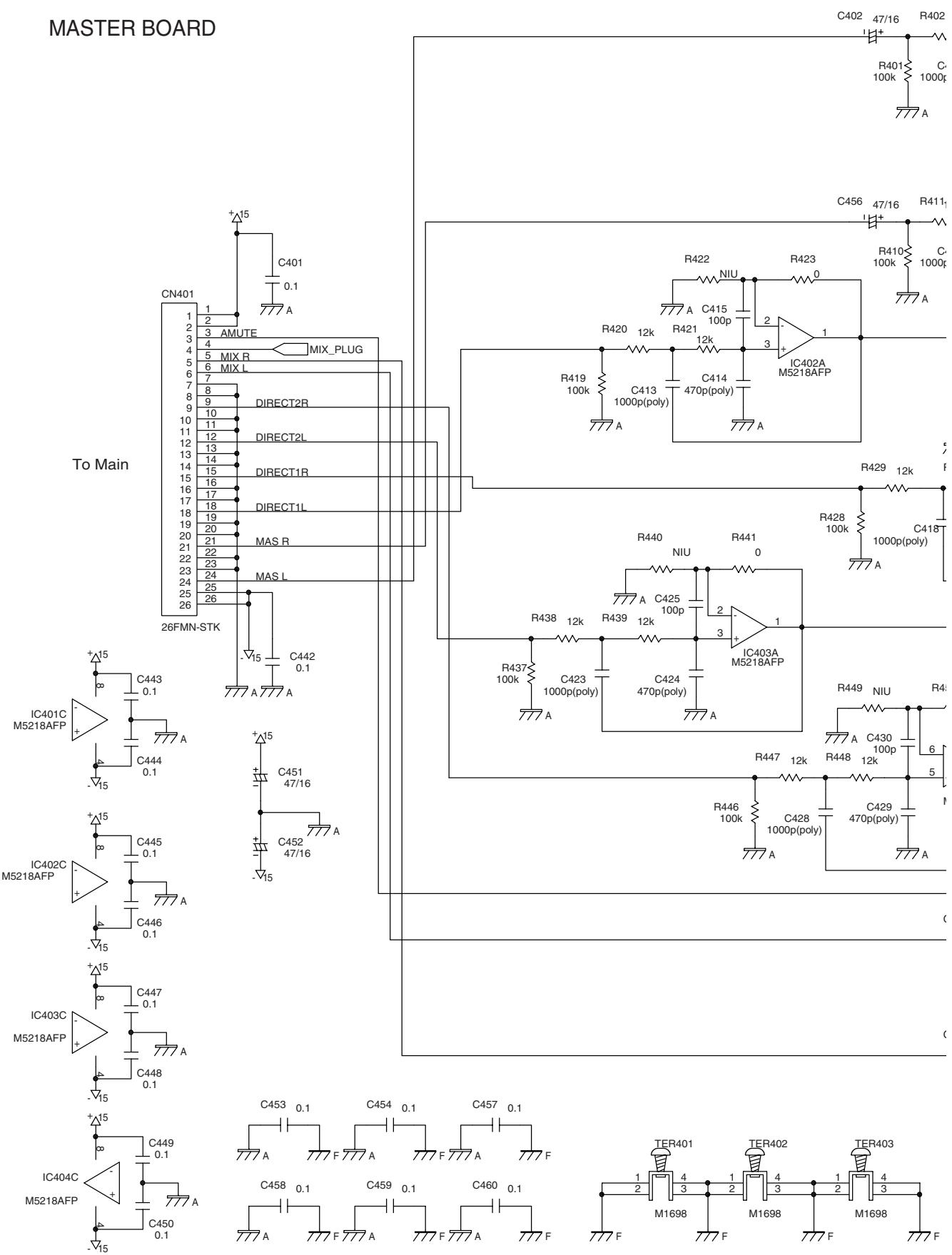
PANEL - L BOARD

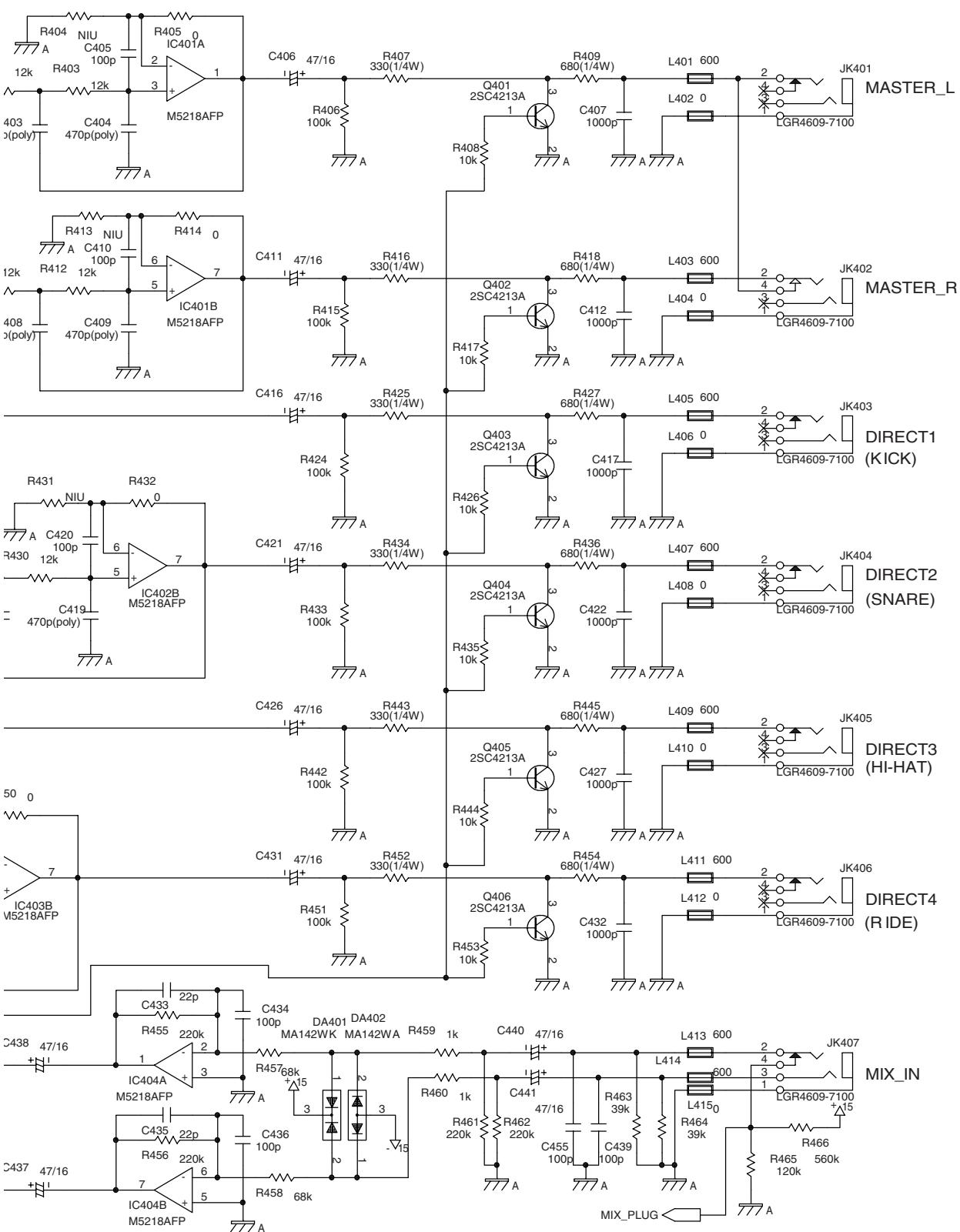


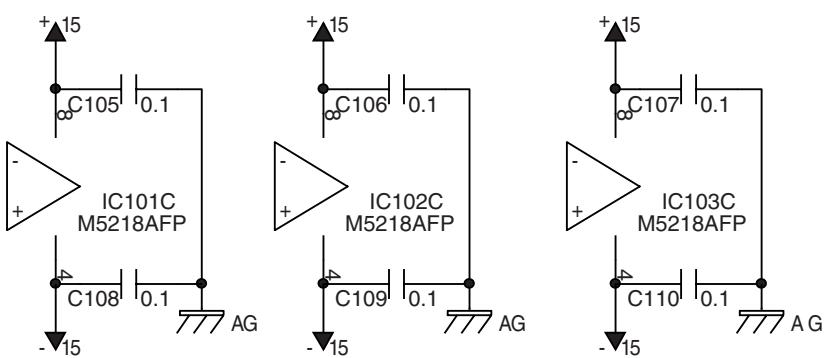
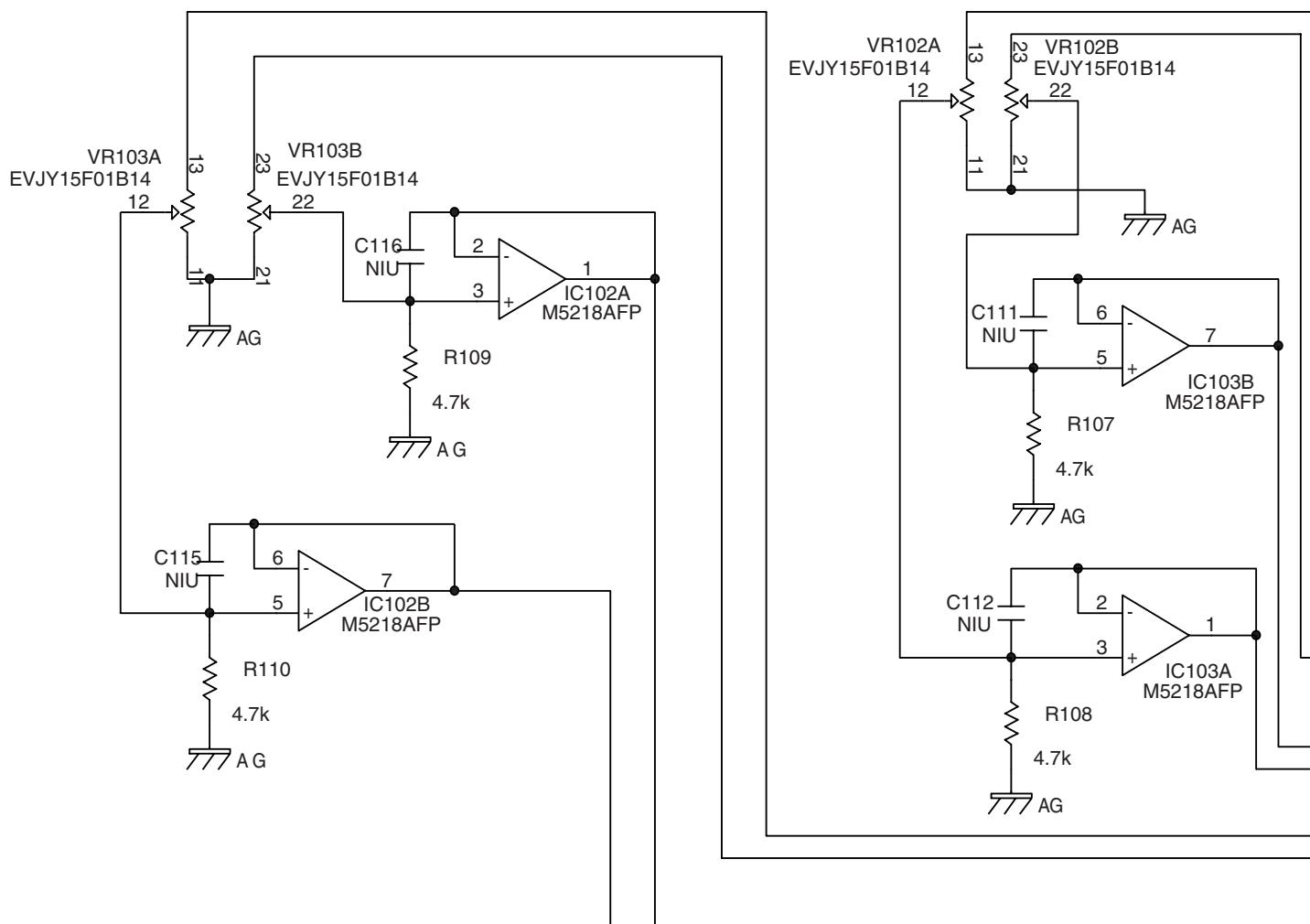


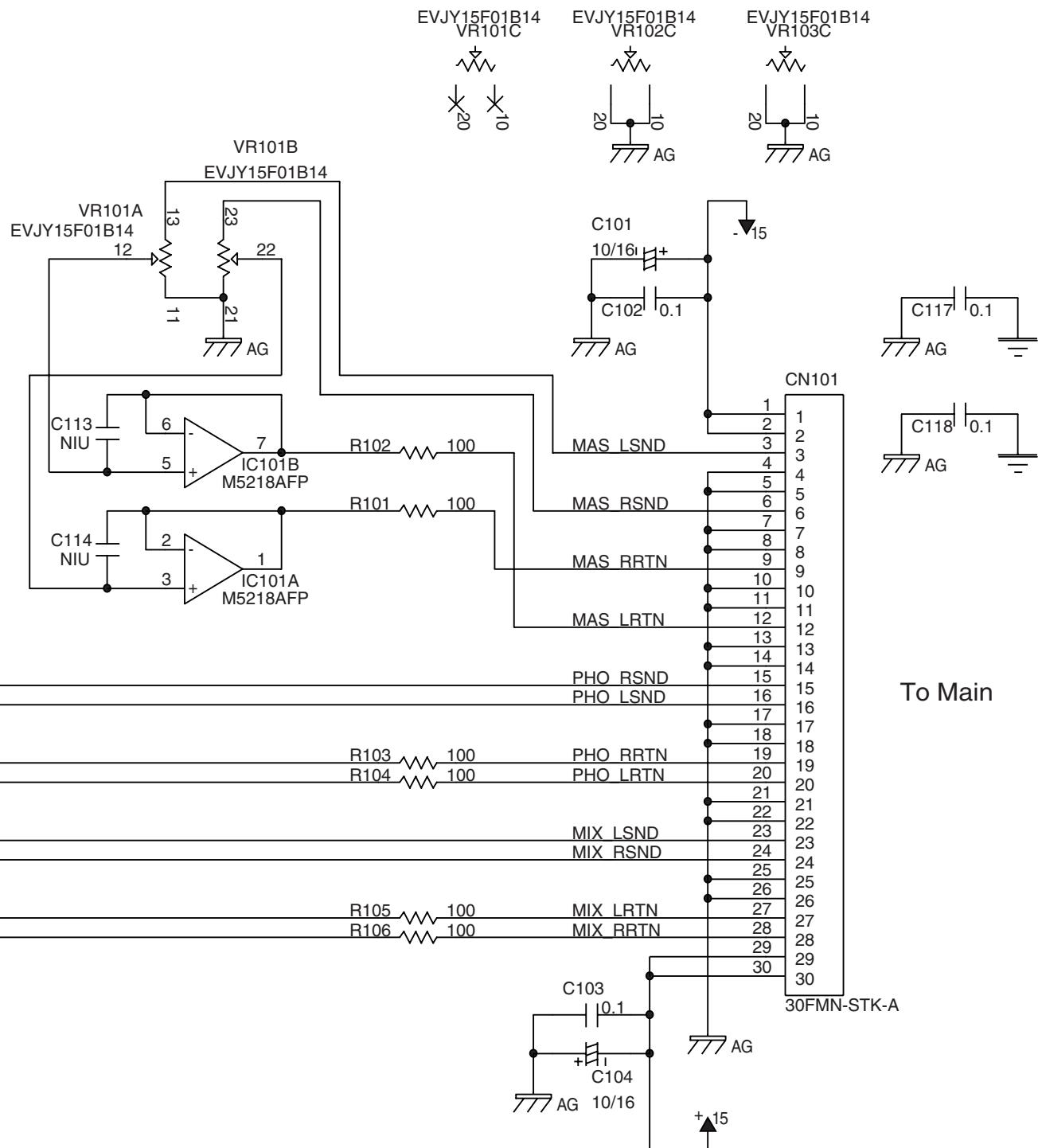
CIRCUIT DIAGRAM (MASTER)

MASTER BOARD



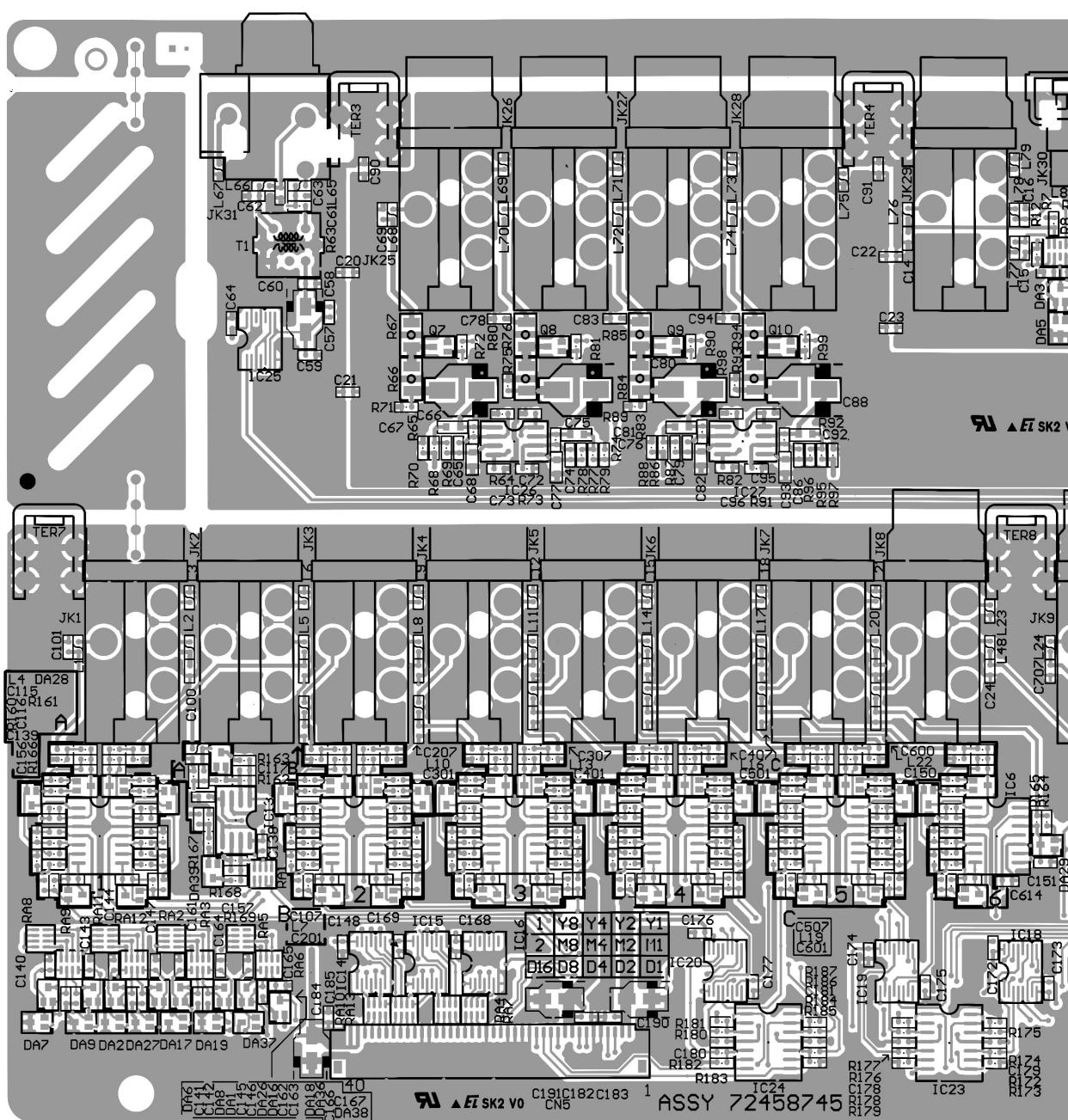


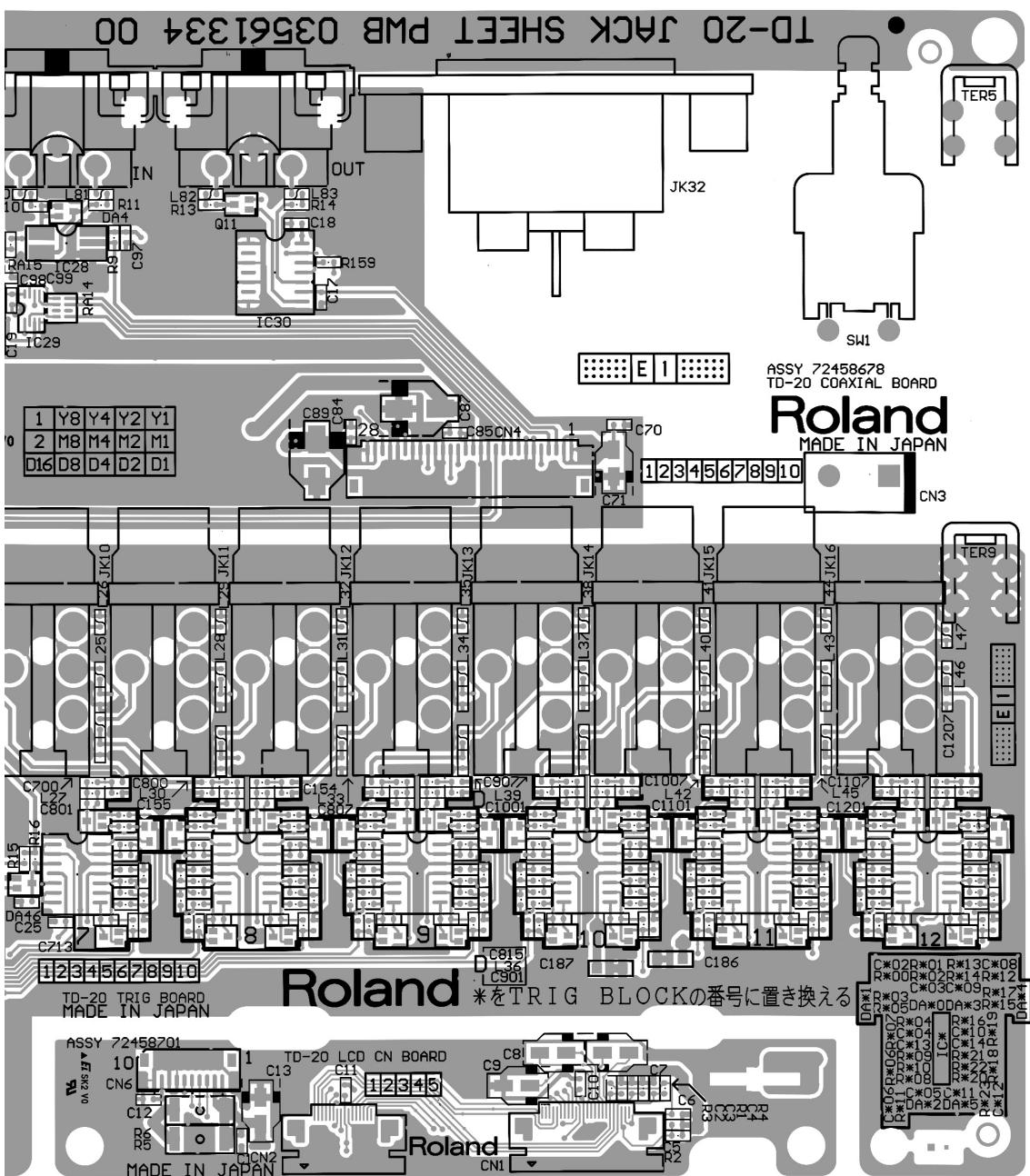
CIRCUIT DIAGRAM (VOLUME)**VOLUME BOARD**



To Main

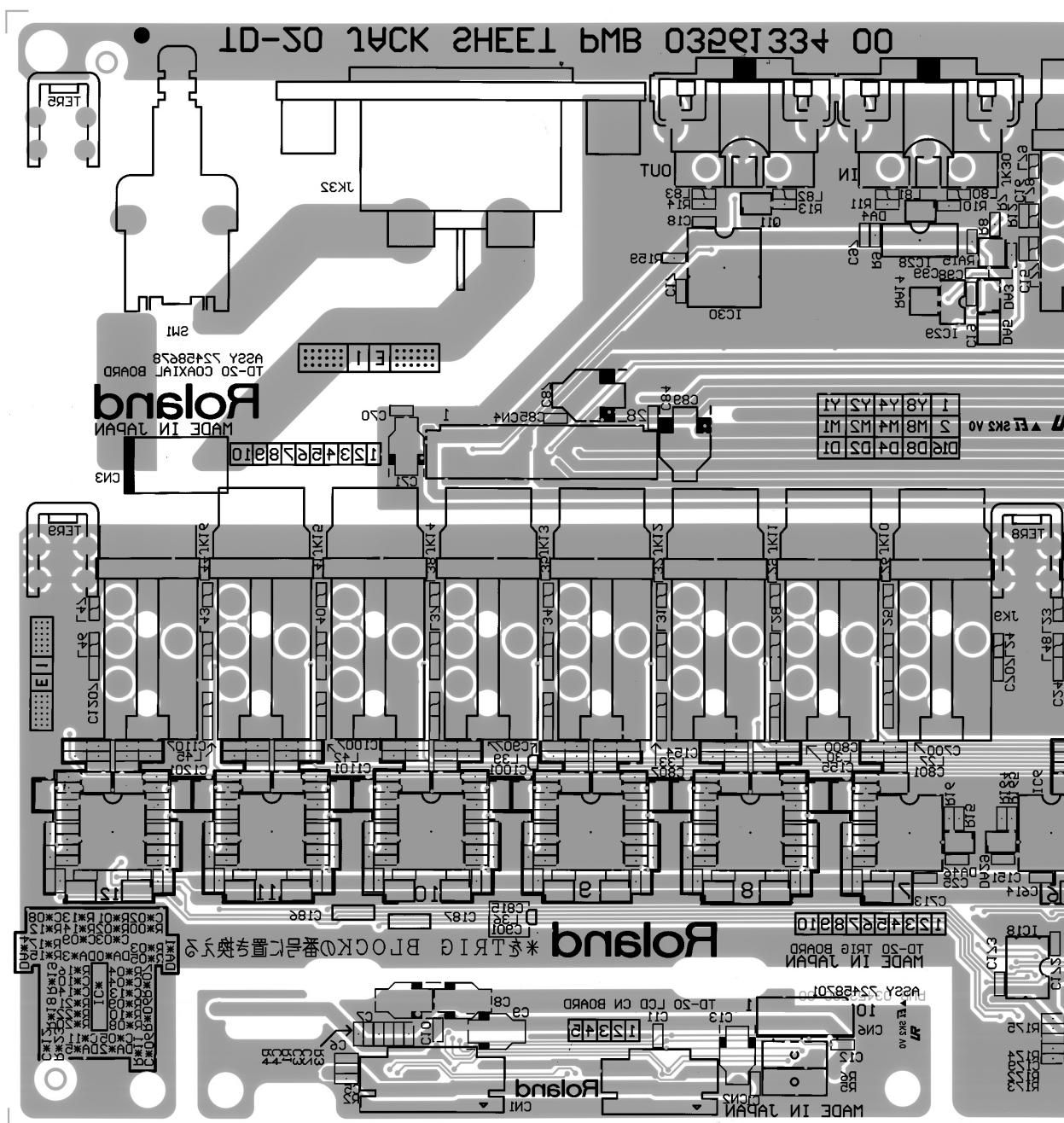
CIRCUIT BOARD (COAXAL/TRIG/LCD CN)

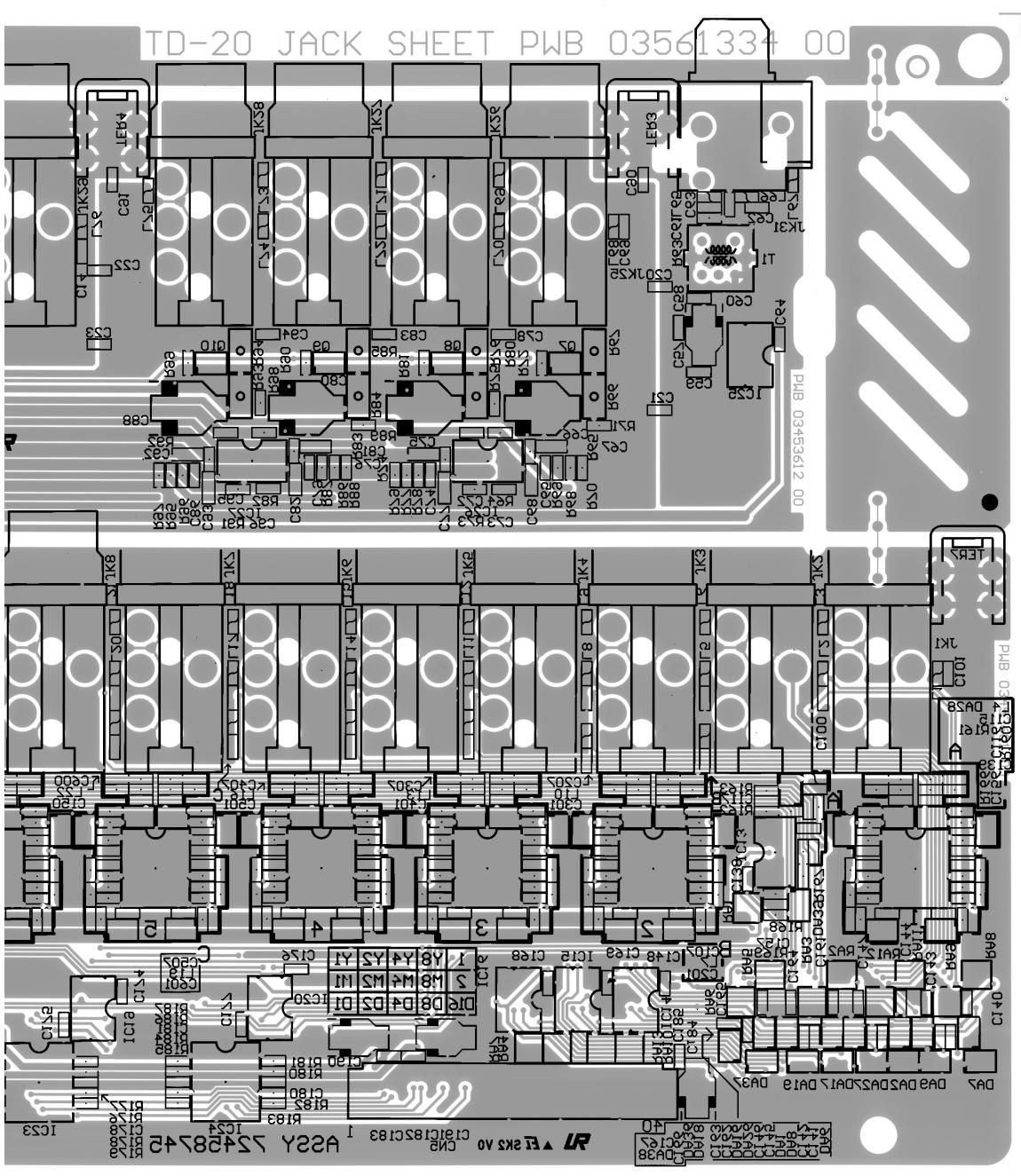




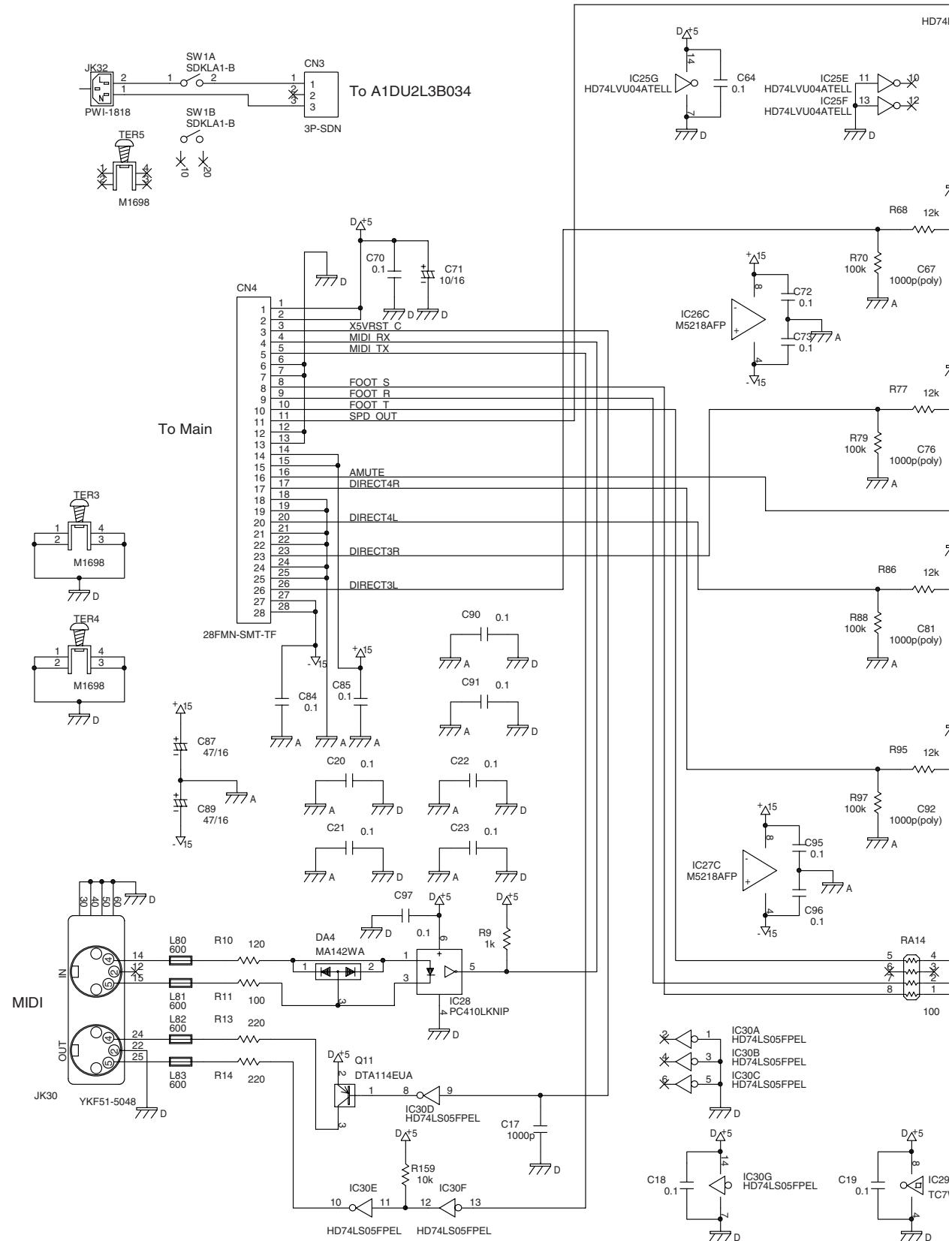
View from components side

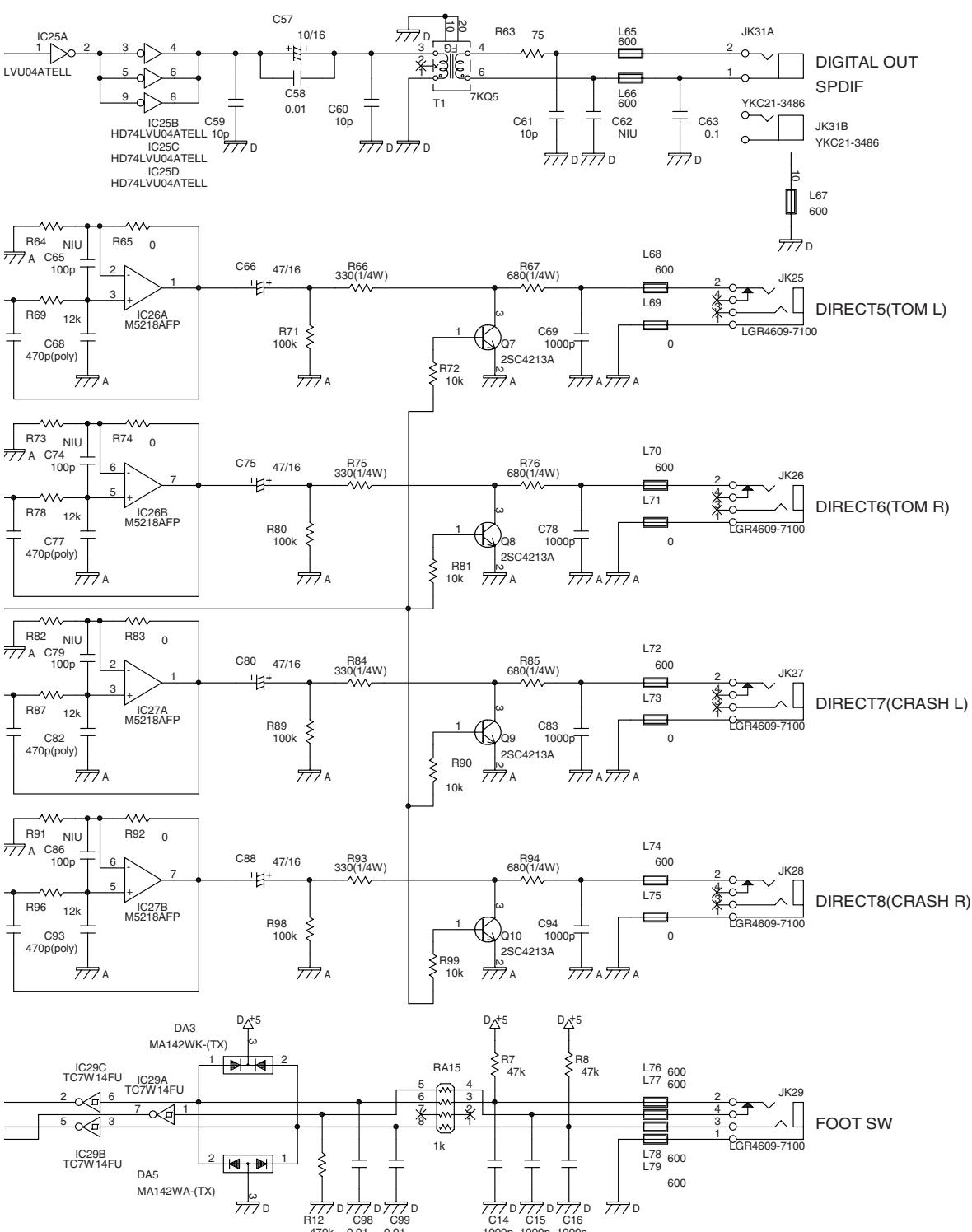
CIRCUIT BOARD (COAXAL/TRIG/LCD CN)



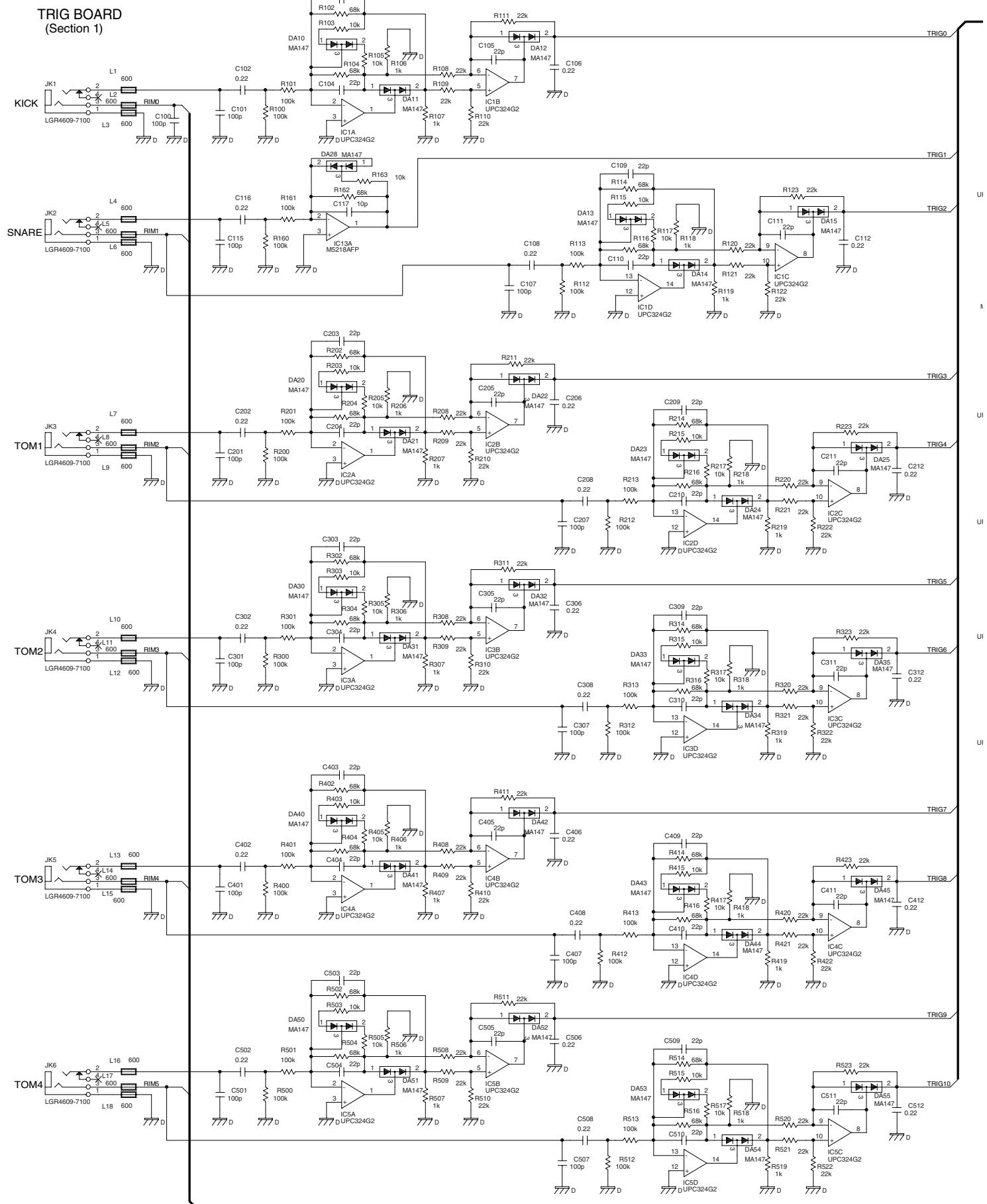


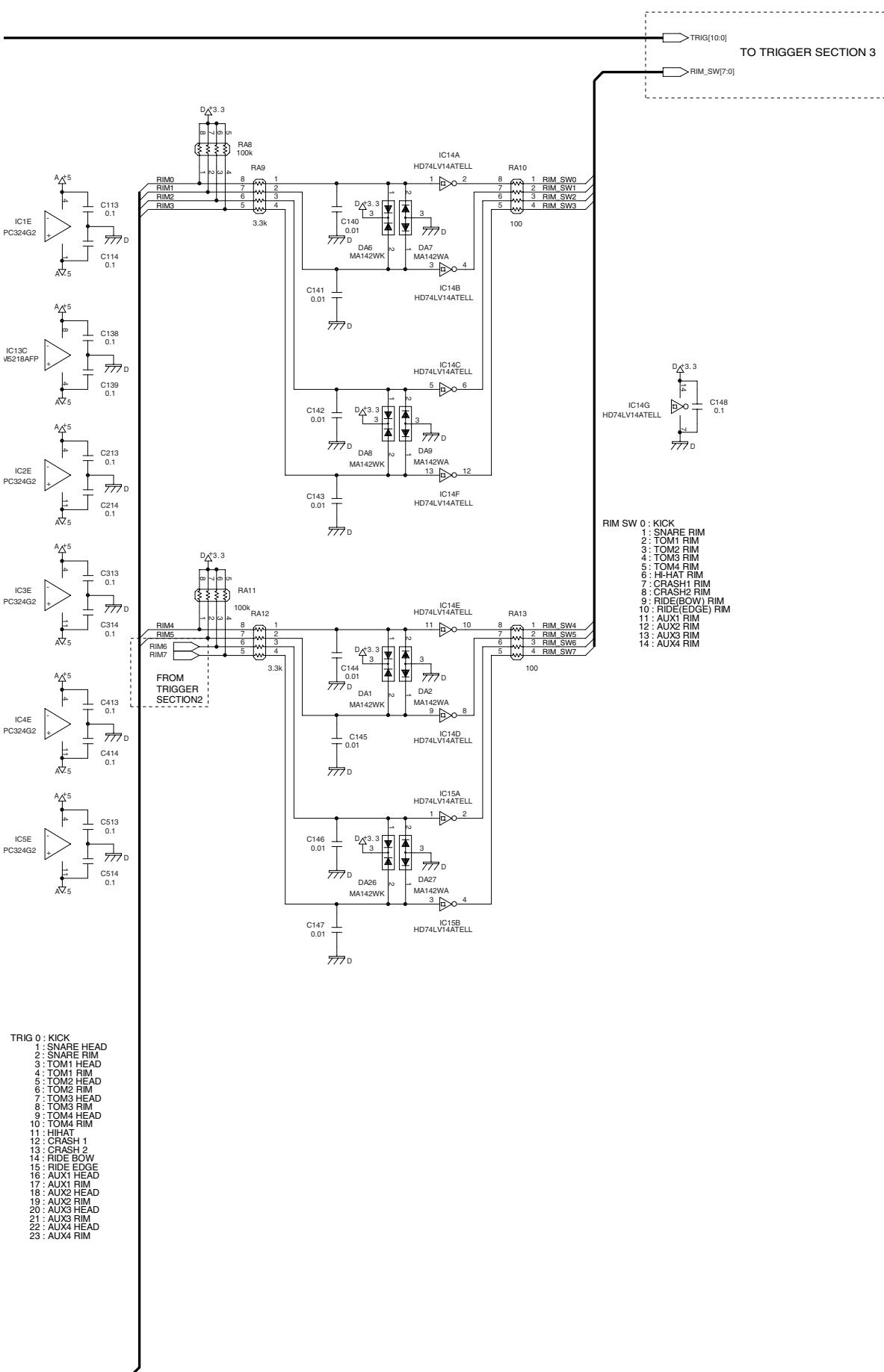
View from foil side

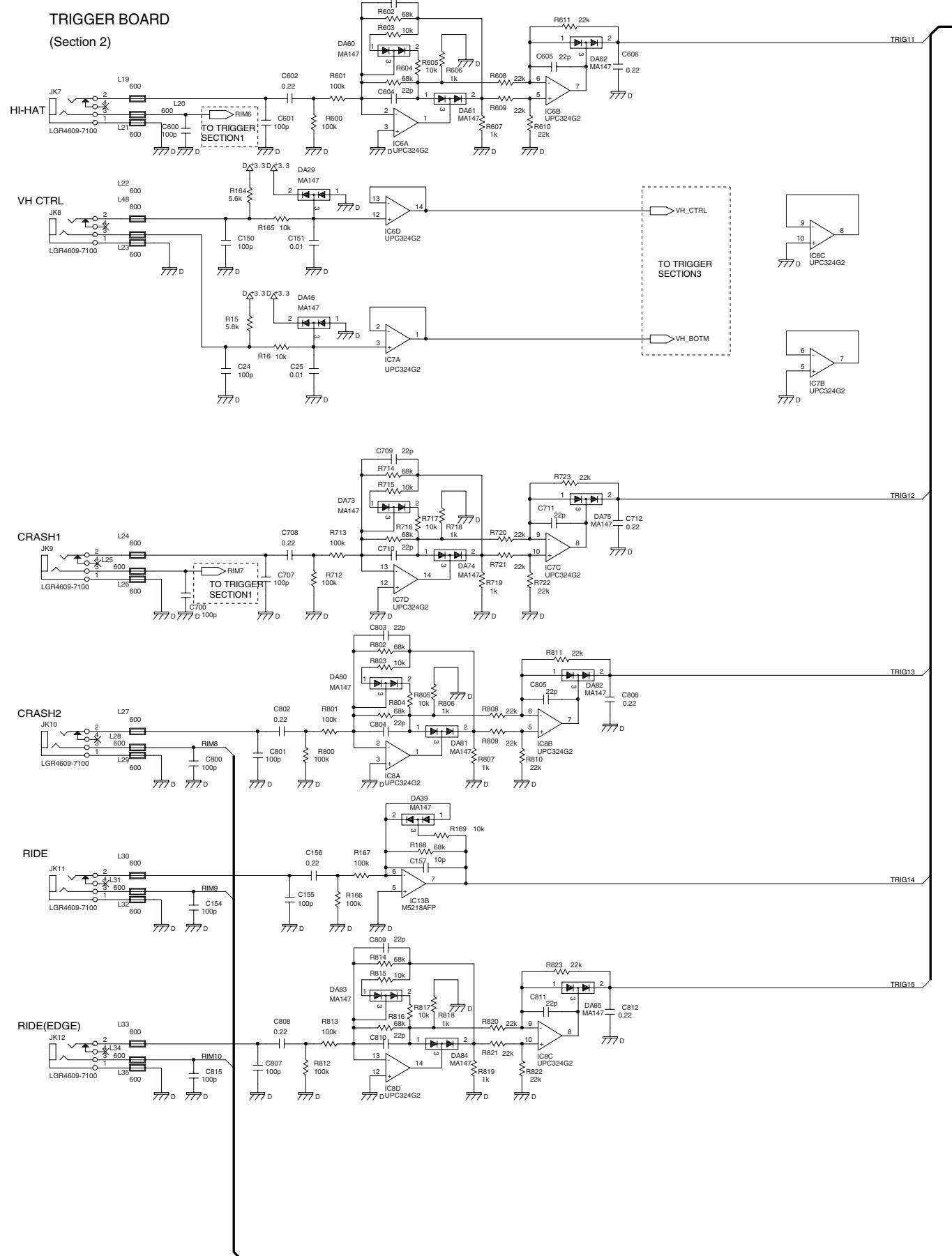
CIRCUIT DIAGRAM (COAXIAL)

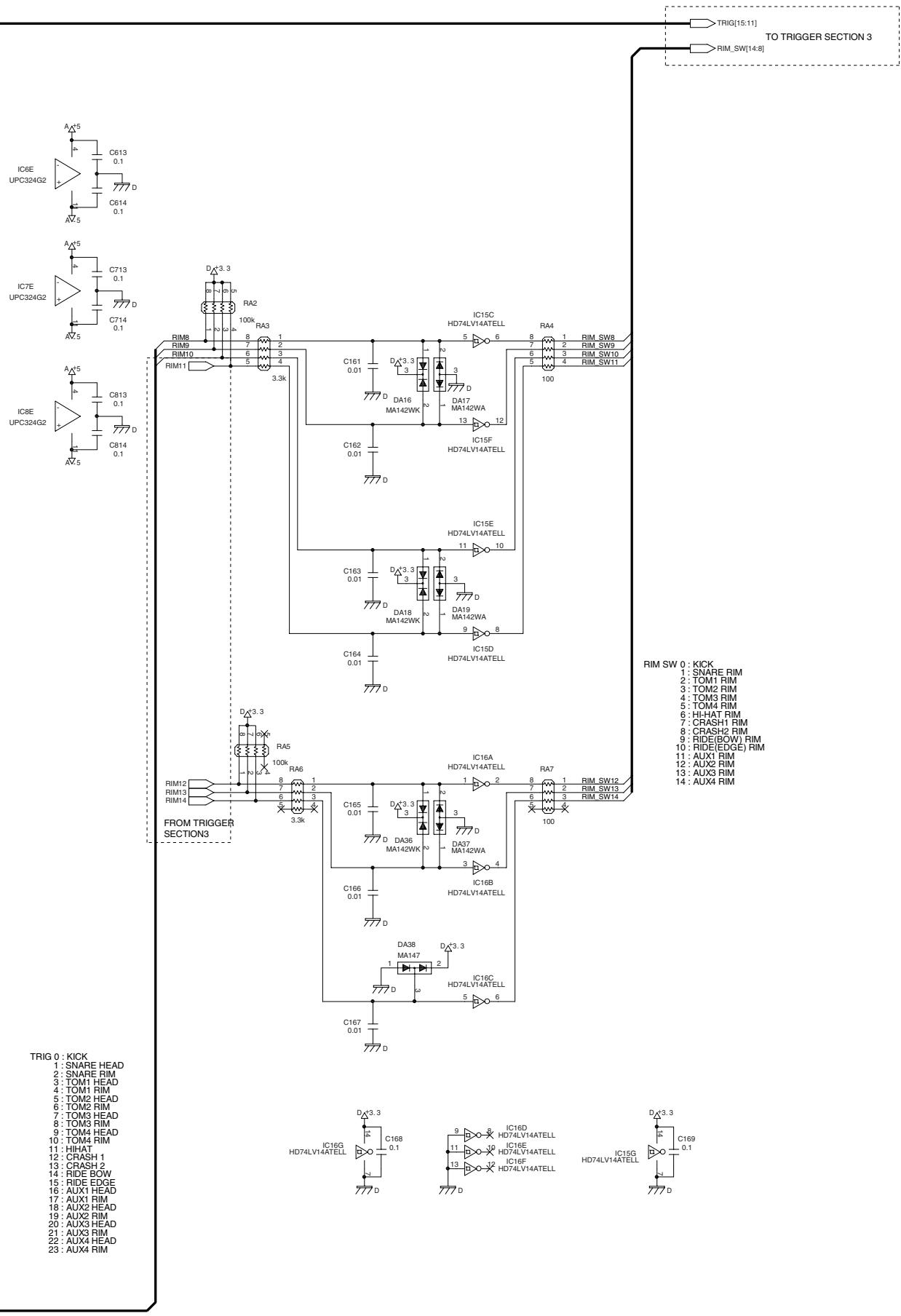


CIRCUIT DIAGRAM (TRIG 1/3)



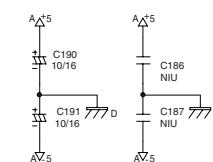
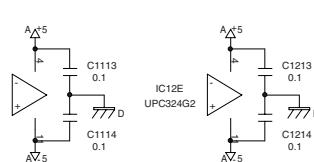
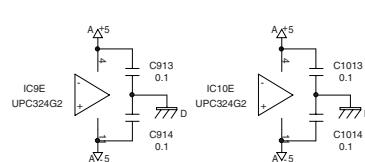
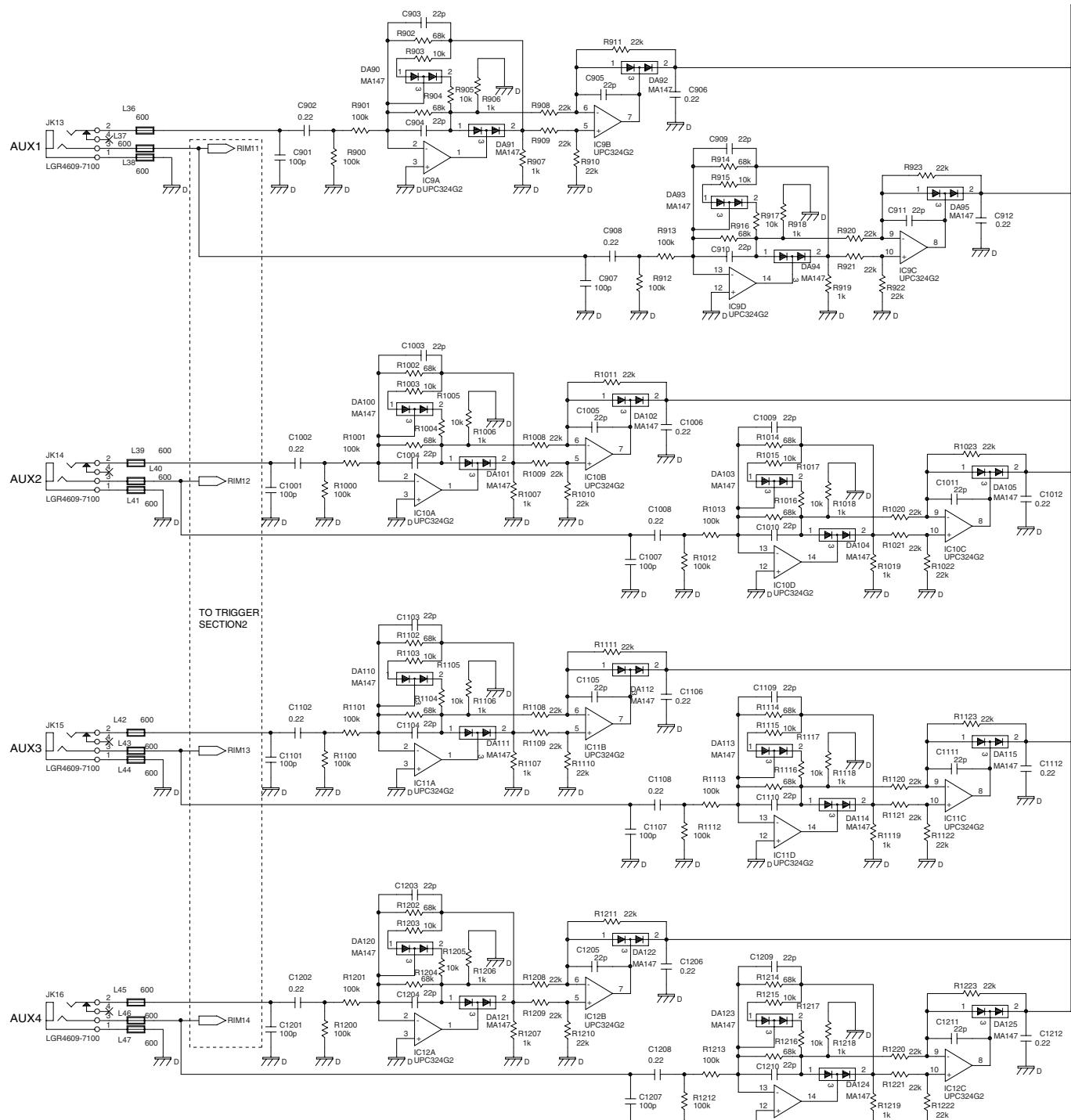


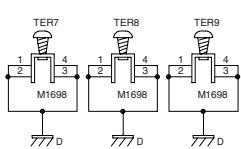
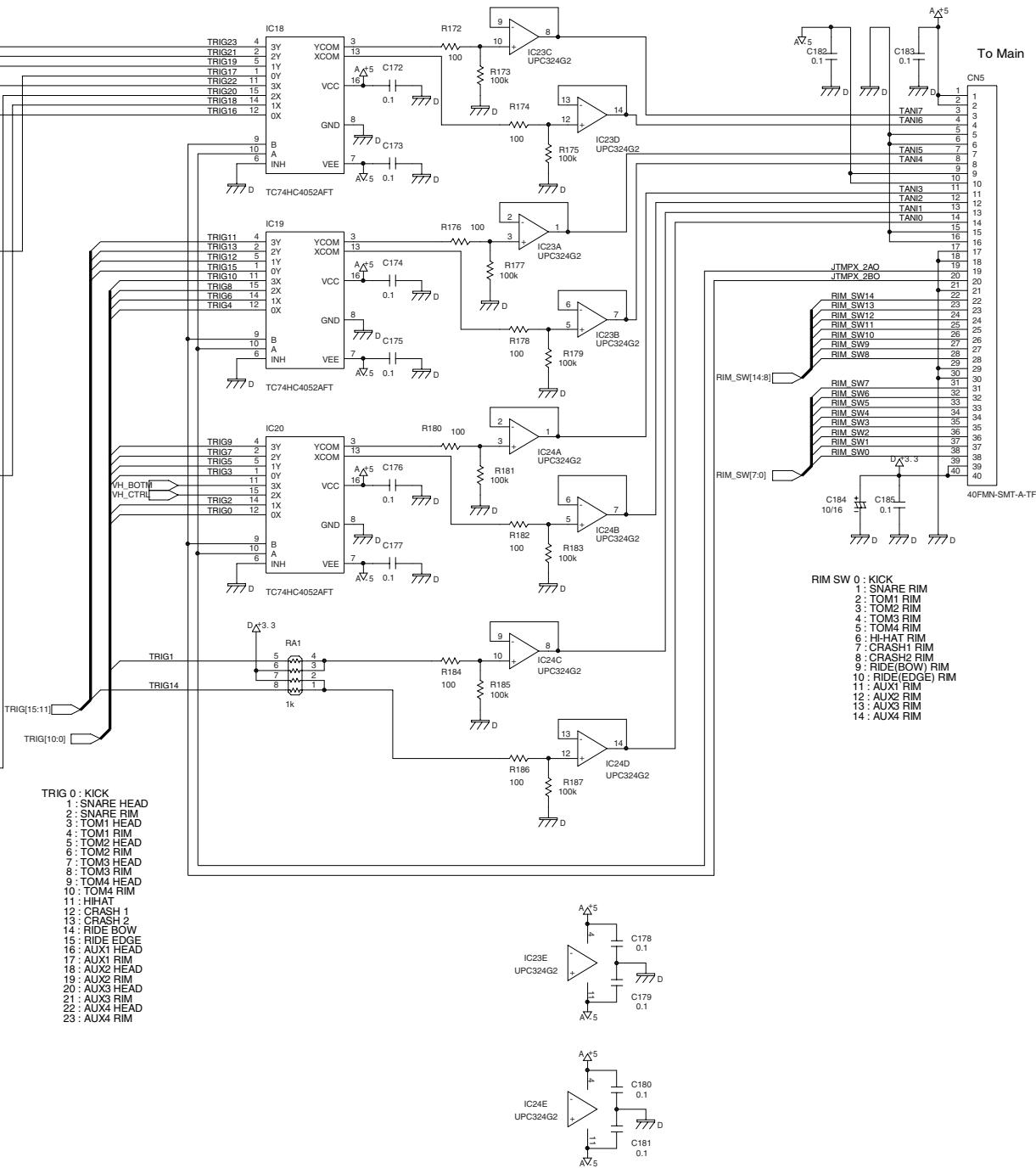
CIRCUIT DIAGRAM (TRIG 2/3)



CIRCUIT DIAGRAM (TRIG 3/3)**TRIG BOARD**

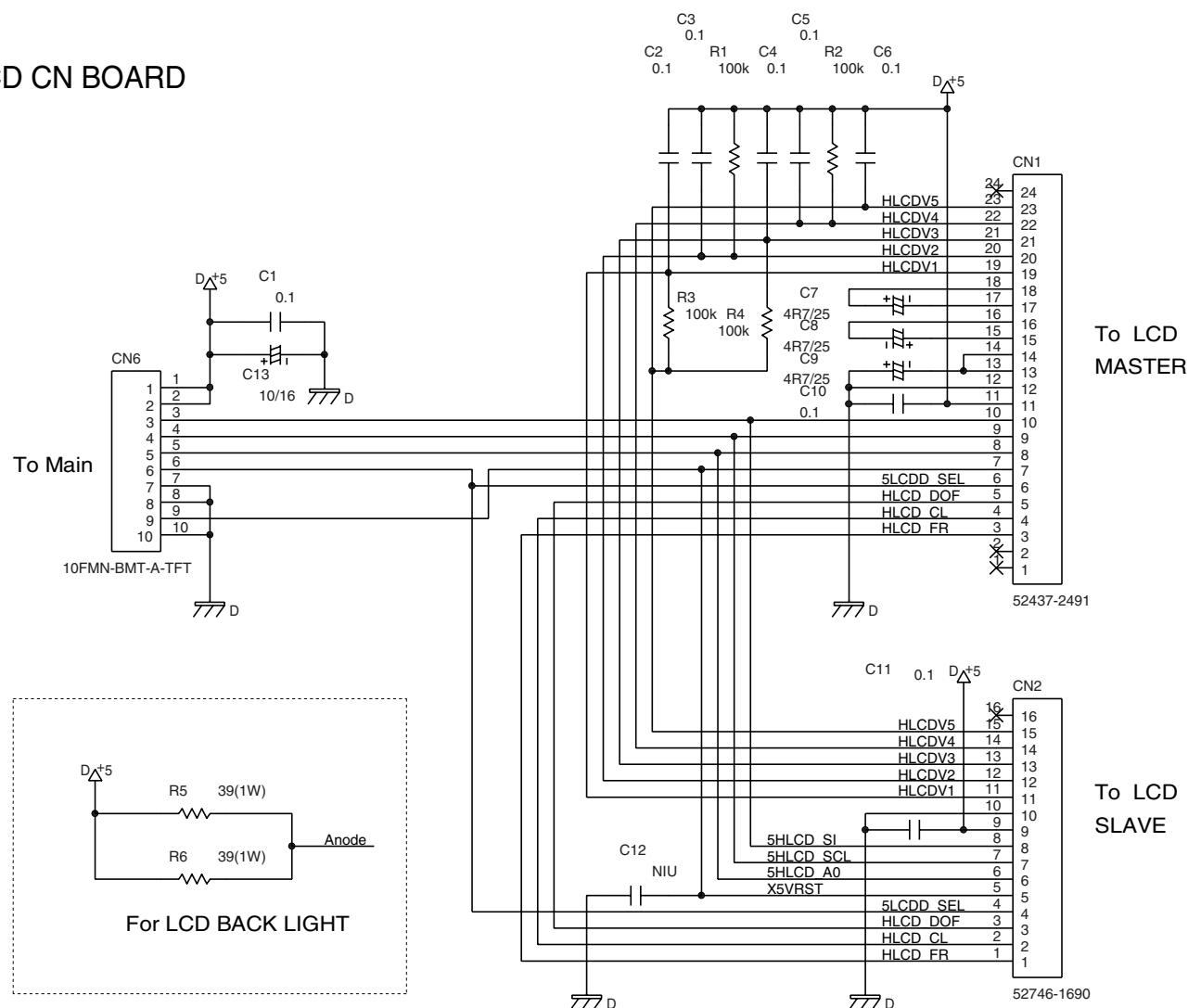
(Section 3)





CIRCUIT DIAGRAM (LCD CN)

LCD CN BOARD



ERROR MESSAGES

Backup Battery Low!

The internal backup battery of the TD-20 (a battery that maintains data in the user memory) has run down.

Replace the battery.

Backup NG!

Data in the TD-20's memory may be corrupted. The TD-20's internal backup battery (the battery used for saving User memory data) is fully drained; internal data has been lost.

Replace the battery. Follow the messages appearing on the screen to carry out Factory Reset; you will then be able to use the unit temporarily.

MIDI Communication Error!

It is possible that the power has been turned off for the MIDI device connected to the TD-20's MIDI IN connector.

Check the power of the connected MIDI device.

System Error!

A problem has occurred with the internal system.

Check whether there is any fault in hardware.

Measure Maximum!

The maximum number of measures that can be recorded to one pattern has been exceeded; no further recording or editing that adds measures can be carried out.

Delete unneeded measures from the pattern being recorded or edited.

Step Maximum!

The maximum number of steps that can be recorded to one chain has been exceeded; no further editing that adds steps can be carried out.

Delete unneeded steps from the chain being edited.

Data Overload!

Pattern contained an excessive amount of data, and as a result could not be output successfully from MIDI OUT.

Try eliminating a part that has too much data.

Not Enough Memory!

Pattern recording or editing could not be carried out because there was not enough internal memory.

Try deleting patterns that are no longer needed.

No Card!

No card is in the memory card slot.

Insert a memory card.

No Space!

There are no empty space on the memory card.

Delete unneeded data.

No Data!

No data you request on the memory card.

Unsupported!

A card the size of which is not supported by TD-20 has been inserted.

Cards supported by TD-20 are 3.3 V CompactFlash cards with the capacity of 16 to 512 MB. Check the card.

Unformatted!

A card the format of which is not supported by TD-20 has been inserted.

Format the card.

Card Damaged!

The data stored on the card has been corrupted.

Format the card.

BULK DUMP Checksum Error!

The checksum value of a system exclusive message was incorrect.

Correct the checksum value.

BULK DUMP Receive Address Error!

The receive address of a system exclusive message was incorrect.

Correct the receive address.

BULK DUMP Receive Data Error!

A MIDI message was received incorrectly.

If the same error message is displayed repeatedly, there is a problem with the MIDI messages that are being transmitted to the TD-20.

BULK DUMP Receive Time Out!

The interval in receiving system exclusive messages were too long.

Make the interval of the data shorter.

Messages

BULK DUMP Receiving... Please Wait.

Bulk data is now being received.

BULK DUMP Aborted!

Bulk data transmission was halted.

Preset Pattern!

You cannot record on the preset pattern.

Copy the pattern onto a user pattern.

Empty Pattern!

This pattern contains no performance data; it cannot be edited.

Select the other pattern that contains performance data.

No Empty Pattern!

There are no empty patterns for recording.

Delete unneeded pattern.

MIDI Offline!

A MIDI cable was disconnected. (Or communication with the external MIDI device stopped for some reason.)

Make sure that MIDI cables have not been pulled out or broken.

MIDI Buffer Full!

A large amount of MIDI messages were received in a short time, and could not be processed completely.

Confirm that the external MIDI device is properly connected. If the problem persists, reduce the amount of MIDI messages sent to the TD-20.

No Empty Backup!

There are no empty backup area on the memory card.

Delete unneeded backup.

No Empty Backup Pattern!

There are no empty backup pattern on the memory card.

Delete unneeded backup pattern.

Power On Too Long. Please Turn Off!

The power remains ON for a long time.

Turn the TD-20's power off, then turn on again.

Auto Shutdown Completed. Please Turn Off!

The power remains ON for a long time.

Turn the TD-20's power off, then turn on again.